
This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>



Madagascar

W. J. L. -

SUPPLEMENT,

1898,

RELATING TO

ISLANDS IN THE SOUTHERN INDIAN OCEAN,

Westward of longitude 80° East,

INCLUDING

MADAGASCAR.

1891.

CORRECTED TO AUGUST, 1898.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:

PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,

BY EYRE AND SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,

AND SOLD BY

J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY CHARTS,

31, FOLTRY, AND 41, KING STREET, TOWER HILL.

1898.

Price 25 pence

(To be pasted on inside of cover of all Sailing Directions.)

NOTATIONS OF SUPPLEMENTS OR HYDROGRAPHIC NOTICES RELATING TO THIS BOOK.

To be filled in by Navigating Officer.

[In Chart Depôts the two first columns are alone to be filled up.]

Whether Supplement or Hyd. Notice.	Date of Publication and Number.	Whether pasted in or noted in Margins of book, and Date of such correction.

x (3)10715.

7

British Admiralty.

SUPPLEMENT,

1898,

RELATING TO

ISLANDS IN THE SOUTHERN INDIAN OCEAN,

Westward of Longitude 80° East,

INCLUDING

MADAGASCAR.

1891.

CORRECTED TO AUGUST, 1898.

[H. A. T. M. 1898.]

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:

PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,
BY EYRE AND SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,

AND SOLD BY

J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY CHARTS,
31, POULTRY, AND 11, KING STREET, TOWER HILL.

1898.

c

Price Ninepence.

ADVERTISEMENT TO SUPPLEMENT, 1898.

This Supplement contains a summary of all the information published by the Hydrographic Office, Admiralty, London, since the issue of the Sailing Directions for the Islands in the Southern Indian Ocean, westward of longitude 80° E., including Madagascar, 1891.

To this is added information received from Her Majesty's surveying vessels, remark books of Her Majesty's ships, and other sources; more especially as regards Madagascar, from Paris Hydrographic Notices.

This Supplement cancels Hydrographic Notice No. 9 of 1895 and all Notices to Mariners relating to islands in the Southern Indian Ocean, &c., up to and inclusive of No. 144 of 1898.

W. J. L. W

*Hydrographic Office,
Admiralty, London,
August, 1898.*

The existence of this Supplement is to be entered on the opening page of the Sailing Directions for the Islands in the Southern Indian Ocean, 1891. The information contained in it is to be carefully considered.

SUPPLEMENT,

1898,

For later information respecting the lights which are described in this work, Seamen should consult the Admiralty List of Lights, Part VI., for South Africa, East Indies, &c. These Light Lists are published early in the current year, corrected to the preceding 31st December.

x (3)10,15.

The several paragraphs of this Supplement follow the order of the paging of Sailing Directions for the Islands in the Southern Indian Ocean, 1891; the pages to which reference is made in that work being noted in the margin of this Supplement.

Information relating to Charts.—“Gas Buoys.”—The p. xli. lights shown by gas buoys cannot be implicitly relied on, as, if occulting, the apparatus may get out of order, or the light may be altogether extinguished.

e (3)10715. 500.—1/1900. Wt. 25146.

A 2

ADVERTISEMENT TO SUPPLEMENT, 1898.

This Supplement contains a summary of all the information published
by the Hydrographic Office. ~~Admiralty London 1898~~

The existence of this Supplement is to be entered on the opening page of the Sailing Directions for the Islands in the Southern Indian Ocean, 1891. The information contained in it is to be carefully considered.

SUPPLEMENT,
1898,
RELATING TO
SAILING DIRECTIONS
FOR THE
ISLANDS IN THE SOUTHERN INDIAN OCEAN,
1891.

Corrected to August 1898.

The several paragraphs of this Supplement follow the order of the paging of Sailing Directions for the Islands in the Southern Indian Ocean, 1891; the pages to which reference is made in that work being noted in the margin of this Supplement.

Information relating to Charts.—“Gas Buoys.”—The p. xli. lights shown by gas buoys cannot be implicitly relied on, as, if occulting, the apparatus may get out of order, or the light may be altogether extinguished.

CHAPTER I.

p. 5. **MADAGASCAR.—History.**—In 1894 the French Government advanced claims on the Hova Government, and on the 18th October a French envoy delivered an ultimatum; upon its refusal a force of 15,000 men was despatched to march upon the capital from Mojanga, on the west coast. Antananarivo was occupied on 30th September 1895, and the next day a treaty was signed by the Queen, by which all the French claims were admitted. A Protectorate was at once established, but in 1896 the island was declared a French Colony, and, on 27th February 1897, the Queen was called upon to resign, and was at once removed to Réunion, where she arrived on 4th March. The Prime Minister, Rainilairivony, who had been made prisoner and deported, died at Algiers in 1896.

p. 11. **Docks** at Mauritius, *see* page 57; at Réunion, *see* page 73.

p. 20. **TRADE.**—The following information as to the present state of trade at the various ports in Madagascar, is obtained from a recent report (1898) on the commerce and industry of that Colony, made by the Governor-General.

The chief trading ports on the east coast, working from north to south, are, Diego Suarez, Vohimao, Port St. Mary, Tamatave, Vatomandri, and others; on the west coast, Hellville, Mojanga, and others.

Diego Suarez is a place of call for the steamers of the Messageries Line, whence a branch line runs to Mozambique, Beira, and Lorenzo Marques. The Havre S.S. Company and other vessels carrying cattle to Mauritius and Réunion also call here, and at the time of the north-east monsoon many sailing vessels from Bombay bring supplies for the Indian traders.

Vohimao.—The export trade of this port is principally in cattle, conveyed on a small steamer belonging to a French company, and carried on by Indian and Chinese traders. These traders penetrate far into the interior with cotton goods, household utensils, glassware, common cutlery, yarn, &c., which they barter for rice, gum, bees-wax, rubber, skins, woods, and *rafia*. The above goods are carried on the backs of native porters.

Port St. Mary is a place of call for the Messageries steamers.

Tamatave is the commercial centre and principal trading port of the whole island. There are a certain number of French merchants here, but British, American, German, and Swiss houses do also a fair amount of business; Indian and Chinese traders are numerous, the latter having more

See chart, No. 597.

than a hundred establishments, where they chiefly deal in rice and other provisions used by Europeans. In view of the increase in the number of these Asiatics, the Government has taken measures in the form of taxation to minimise the effect of their competition. The steamers touching at Tamatave are those of the various French companies, the English Castle line, and the Oswald line of Hamburg, besides numerous sailing vessels and coasting craft.

Andovoranto can only be used during about eight months in the year, but has a certain commercial importance, as it is the point where the trade route from Tamatave to the capital leaves the coast; about ten trading firms are established here. Its export trade consists chiefly of ox-hides and *rafia*.

Vatomandri, next to Tamatave, is the chief port of entry for textiles destined for the interior, and has the advantage of being connected with Antananarivo by a route along which goods are conveyed at three-fifths the charge from Tamatave.

Other Eastern Ports.—The French have no direct communication with the two ports of Mananjara and Fort Dauphin; the greater portion of the exports from these parts goes to London, while some is conveyed by the Castle line to Hamburg. The ports of Farafangana and Vangaindrano are visited by sailing vessels from Mauritius; the imports, as in all the southern ports of the island, come principally from London and Hamburg.

Hellville, in the island of Nosi Bé, is a very important centre of trade. The steamers of the Messageries call here twice a month, and it is the starting point of the coasting trade with the smaller western ports of the island, carried on by a small steamer. The trade along this coast as far as Mojanga is in the hands of Indians, who deal in British and German goods, and Bombay textiles. There are two important German trading firms established at Nosi Bé.

Mojanga, from its situation and excellent harbour, is destined to become one of the starting points of the Antananarivo trade route, and to have a commercial future of its own. The waterway of the Betsiboka river is practicable for small steamers as far as Suberbieville, 200 miles from the coast, for nine months in the year. From that point to the central plateau the road is being improved, and trade will grow as security of communication in the island increases. Many trading steamers visit Mojanga from the Zanzibar coast and Bombay, and smaller vessels connect the port with Nosi Bé, Zanzibar, the Comoro islands, Morondava, and Nosi Vei; and a small steamer of the Messageries line makes a monthly

double trip between Nosi Bé and Nosi Vei, calling at Mojanga and Maintirano.

Other Western Ports.—To the south of cape St. Andrew are several small ports, Tombolarom(?), Maintirano, Manambolo, Tsimanadrafozana, and Morondava, which once carried on a considerable trade by sailing vessels with the African coast. These places are solely worked by Indians, who export to the German houses of Nosi Bé, gold dust, wax, tortoise-shell, rubber, and woods and essences from the neighbouring forests. Between the Mangoka and St. Augustine rivers lies a district where rich meadows and forests are found, and where maize and other cultivation is carried on. This region once furnished quantities of orchilla, a dye moss, the collection of which has been almost entirely abandoned.

The imports of the west coast consist chiefly of cloths, cotton goods, glassware, rum, gunpowder, and iron household utensils; the majority of these goods are of German origin. The trade is in the hands of British, French, German, and American houses, and of Indian and Arab traders.

The **imports** to Madagascar from the United Kingdom in 1896 amounted in value to 149,565*l.*; the **exports** to the United Kingdom to 92,535*l.*

p. 22.

COMMUNICATION.—In regard to communication by steamer with Madagascar, the principal companies touching at the island are—

1. **Messageries Maritimes.**—The steam vessels of this line start from Marseilles and call at Port Said, Suez, Jibuti, Zanzibar, Mayotta, Mojanga, Nosi Bé, Diego Suarez, St. Mary, Tamatave, Réunion and Mauritius. Two branch lines run in connection with the above, namely, one down the west coast of the island, leaving Nosi Bé and touching at Maintirano, Morondava and Nosi Vei (Tulléar); and the other serving the east coast of Africa, leaving Diego Suarez and calling at Mozambique, Beira, and Lorenzo Marques.

2. **Havre Peninsula Company.**—These vessels start from Havre and Bordeaux, touch at Marseilles, and thence to Mojanga, Tamatave, Réunion and Mauritius.

3. **Chargeurs Réunis Company.**—The vessels of this line also start from Havre and Bordeaux, touch at several places on the west coast of Africa, and call at the Cape and Lorenzo Marques *en route* to Tamatave.

4. **Castle Line.**—From London *viâ* the Cape, calling at Fort Dauphin, Mananjara, and Tamatave, *en route* to Mauritius.

See chart, No. 597.

Telegraph.—There is telegraphic connection by submarine cable between Mojanga and Mozambique, and thence to all parts of the world.

Madagascar, East coast.—Winds.—The north-east monsoon, p. 25. from October to April, is irregular; very variable winds, or calms, are experienced everywhere from cape Amber to Fort Dauphin, especially in January, February, and March. Gales are frequent after December, sooner or later according to the year.

CYCLONES.—It is chiefly between cape East and Matitanana that p. 33. cyclones strike the east coast of Madagascar, but it is very seldom that they extend as far south as Maninzari, or north of cape East. A local and small cyclone was experienced at Diego Suarez in 1894. Upon this coast the premonitory signs of a cyclone may be observed without the storm following. The western trajectory of certain cyclones which have passed over or near Réunion or Mauritius, becomes inflected southwards, east of Madagascar, without their action being felt otherwise than by the ordinary signs which characterise the approach of cyclones or the formation of rollers upon the coast.

In the fine season these rollers are sometimes caused by a gale at sea, which is not always felt upon the coast, where a moderate breeze may prevail; but during the winter season they must be taken into consideration, in combination with other premonitory tokens of disturbance. Between the months of December and April, heavy rollers may be regarded as the certain indication of bad weather, sooner or later.

Practical rules for avoiding Cyclones.—At line 25, *for* p. 36. “East, S.E., South,” *read*, “South, S.E., East.”

Madagascar.—Weather.—

TABLE showing the results of the meteorological observations made by Stratton C. Knott, Esq., H.M. Vice-Consul at Mojanga, Madagascar, during the years 1892-3-4, at a height above mean sea level of 134 feet.

Month.	Mean pressure at sea level.	Air temperature.				Percentage of humidity.		Rain.		Weather. No. of days.		Wind. No. of days of.								Gales.		
		Mean.	Mean range.	Extremes.		A.M.	P.M.	No. days.	Fall. ins.	Thun- der.	Clear sky.	Over- cast.	N.	N.E.	E.	S.E.	S.	S.W.	W.		N.W.	Cal.
				Max.	Min.																	
January	ins. 29·865	80	12	93	60	68	72	18	19·6	17½	1	22	8	1	1	1	1	2	2	15	0	1
February	29·911	82	13	93	68	66	67	12	4·9	15	1½	11	4	3	2	1	1	1	3	11	2	0
March	29·920	83	14	95	70	62	63	15	11·3	19	2	6½	8	3	2	5	0	3	1	8	1	0
April	29·954	83	16	95	70	56	61	4½	3·3	8½	12½	4	5½	1½	8½	5	1½	4	1	7	1	1
May	30·043	79	17	92	65	49	57	1½	0·3	3	22½	2½	1	0	2	7½	6	7	1	6	½	0
June	30·071	77	18	92	61	44	51	0	0	0	21	0	0	0	4	10	5	6	½	4	½	0
July	30·113	76	19	90	62	42	48	½	0	0	20	2	1	1½	6	8	5	4	0	4½	1	0
August	30·104	77	20	93	63	40	53	0	0	0	15½	0	2½	3½	6	5	2	2½	1	6	½	0
September	30·066	79	21	95	63	35	60	1½	0·2	½	18	1	3	5	4	5	0	1	4	8	0	0
October	30·016	81	17	97	69	44	65	4	3·2	5	17	2½	4	2	2	4	1	1	5	12	0	0
November	29·988	82	16	99	69	45	66	5½	2·2	6	14½	1	4	1½	1	4	1	½	6	12	0	0
December	29·962	81	14	94	70	62	67	11½	9·4	16	2½	9	9½	1½	1	1	½	0	1½	14	2	0

The diurnal range of the barometer appears to be about ·07 inch, and the average rainfall during the year is 54·5 inches.

From April 1892 to December 1893, the extremes of temperature at Antananarivo were $86\frac{1}{2}^{\circ}$ and 40° . During the same period at Mojanga they were $98\frac{3}{4}^{\circ}$ and 60° . The rainfall for 16 months prior to December 1893, at Antananarivo, was 59.1 inches, which fell on 108 days; and at Mojanga, 65.6 inches in 76 days.*

The sky is most cloudy during the rainy months, from October to April. No hail was observed during this period. Sheet lightning was seen on 27 days during March 1894.

ICEBERGS.—The steam-ship *Hubback* from the Cape of Good Hope to Port Adelaide during January 1897, when passing northward of Prince Edward island in lat. $45^{\circ} 18' S.$, met an iceberg a mile in length and 400 feet high, with others; subsequently meeting many more, one of which was 3 miles long and 600 feet high. On passing to the southward of the Crozet islands an iceberg was observed aground near Penguin island. The *Hubback* continued her way northwards of Kerguelen, continually meeting with ice, and in lat. $47^{\circ} 0' S.$, long. $73^{\circ} 25' E.$, passed an iceberg about 5 miles in length, which was the last ice observed.

The temperature of the air was 40° to 45° , of the sea-water 39° to 44° , being the maximum and minimum for the whole period.

RAIN.—East coast.—The heaviest downfall is with the wind from the westward. At Diego Suarez there is much rain from December to April; but little during the south-east monsoon, at which time the country has a desolate appearance. Near Tamatave the driest months are September, October, November, and occasionally part of December.

Currents.—East coast.†—Between Tamatave and Fort Dauphin p. 12. the *Hugon* found a current setting S.S.W. parallel to the coast at all seasons, whatever the prevailing wind. Between Tamatave and Vatomandri its rate was about one knot per hour, thence to Maninzari it attained $1\frac{1}{2}$ knots; between Maninzari and Vangaindrano 2 knots, and in the vicinity of Fort Dauphin $2\frac{1}{2}$ knots. These rates were slightly influenced by the existing winds.

Between Tamatave and cape Amber during the south-east monsoon (April or May to September), a weak northerly current was found up to St. Mary, increasing gradually so as to attain $2\frac{1}{2}$ knots, and even 3 knots from the Leven islands. In July, August, and September the rate of the current northward of Tamatave was in general proportional to the force of the monsoon, the direction of which it followed. It attained the rate of $2\frac{1}{2}$ or 3 knots in the region where the monsoon is strongest, which

* See Quarterly Journal Royal Meteorological Society, January 1895.

† Paris Hydrographic Notice, No. 3, 1896.

See charts, Nos. 1241 and 597.

comprises a section of about 90 miles both north and south of Diego Suarez.

In the closing months of the year, when N.E. winds are prevalent, and during the season when the winds are very variable, the *Hugon* found between Tamatave and Vohimao, a current of more than one knot setting south with the N.E. winds, or in varying directions according to the existing wind. From Vohimao northwards, irrespective of the wind, a northerly current was always found, strengthening in proportion as Diego Suarez and cape Amber were approached. With the N.E. wind the current is less strong, attaining about one knot.

Between the Antongil peninsula and St. Mary a secondary current was traceable, which was always found setting westward towards Antongil bay; this set, though weak, should be considered when passing this locality at night.

p. 54. **Mauritius to Bombay.**—At line 12, for “Minikai,” read “Minikoi.”

p. 56. **Mauritius to Zanzibar.**—At line 24, for “variable current,” read “variable northerly current.”

p. 57. **West coast of Hindustan to Mauritius.**—At line 25, for “4° N.,” read “4° S.”

p. 60. **Zanzibar to Seychelles.**—At line 19, for “on,” read “in.”

p. 61. **Mauritius to Bombay.**—At line 8, for “Minikai,” read “Minikoi”; and at line 31, for “north-east,” read “north-west.”

CHAPTER II.

p. 66. **CAPE AMBER.—Directions.**—The south-east monsoon makes itself violently felt at cape Amber from May to October, and the currents produce a short, choppy, and very rough sea; the water is smoother and the current less strong near the cape. The *Hugon* was never prevented from making the passage to the eastward at this season; she used to pass the rocky islets in front of the middle point of cape Amber at a distance of from 2 to 3 cables, and though the bottom was visible, there was then a depth of 10 fathoms.

p. 67. **Windsor Castle (Andramaimbo).**—At line 16, for “rising from,” read “rising to the height of 1,289 feet above the sea from.”

See chart, No. 1002.

Mount Amber.—At line 27, *for* “nearly 2,000,” *read* “4,455.”

DIEGO SUAREZ BAY.—Light.—On the south-east point p. 68. of the entrance to Diego Suarez at 1,300 yards S. 59° E. from cape Andranomodi is exhibited, at an elevation of 124 feet above high water, from a masonry tower 26 feet in height, a *flashing white* light, showing a bright flash *every ten seconds*, which should be visible in clear weather from a distance of 14 miles.

Position.—Latitude 12° 14' S., longitude 49° 23' E.

Andrakaka peninsula.—At line 11, *for* “100,” *read* “150.” p. 69. There is no wharf at Diego point.

Approach.—Mount Amber, though certainly the most remarkable landmark for this part of the island, is very frequently obscured by clouds. Mount Raynaud, 1,312 feet high, and Square mountain, 1,263 feet high, near the coast south of Diego Suarez, also very remarkable, are generally visible; these, with the mountain Français and Thumb mountain, enable a ship's position to be determined with certainty. Making the land near Diego Suarez requires much attention, especially during the south-east monsoon, on account of the prevailing set towards cape Amber, more particularly if closing the land by night. Sailing vessels are recommended to keep a good offing until daylight, as the wind is frequently light during the night; every precaution should be taken to guard against this strong N.N.W. current, to avoid the possibility of being drifted to leeward of the entrance of the bay.

Cape Andranomodi (Frederick point) is 115 feet high, the land p. 70. behind it rising to a height of 394 feet at the distance of one mile. There is a signal flagstaff at point Oronjia.

Nosi Volana is 66 feet high. The funnel of the old gunboat *Chacal* has been erected on the northern part, and on the south-east coast a masonry beacon; the funnel is the more conspicuous.

Dundas island (Nosi Longo) or Sugarloaf, elevated 400 feet above the sea, is one of the most remarkable points in Diego Suarez bay, and a good landmark when approaching from the southward. It is covered with bushes.

Dover Castle (Ankaramisampana).—The summit is 892 feet above the sea.

Nosi Langor is a small flat rock, 33 feet high and surrounded by a p. 71. coral reef for two-thirds of a cable; it lies 3 miles within the entrance to Diego Suarez bay, and upon it are buildings for a lighthouse recently

See charts, Nos. 1116 and 758.

established, which form a good mark for vessels entering or leaving. At 2 cables S. 11° E. from Nosi Langor there is a small head of coral with a depth of 15 feet on it, and with $5\frac{1}{2}$ to 8 fathoms close around.

LIGHT.—Nosi Langor light is a *fixed white* light, showing the following sectors:—from N. 79° W. to N. 76° W. (in the fairway of the entrance to the bay); also from N. 69° W., through north, to N. 83° E.; and obscured from other directions.

It is elevated 57 feet above high water, 16 feet above the ground, visible from a distance of 10 miles in clear weather, and shown from the terrace of a rectangular house, of masonry, painted grey, with a wall screen at a distance of about 46 feet in front of it.

Approximate position, lat. $12^{\circ} 13' 20''$ S., long. $49^{\circ} 19' 40''$ E.

Nosi Loatrafasano (Sepulchre island) is the most remarkable, from its form and height (328 feet) in Androvatofotsi. It is called Sepulchre island, from the natives burying their dead there in caverns, in which, it is said, they are preserved for long periods. About one mile north of it are two shoal heads of coral, with $2\frac{1}{2}$ and $2\frac{1}{4}$ fathoms on them.

Port Nievre.—Shoal.—The shoal, which was said to have had only $2\frac{3}{4}$ fathoms over it, does not exist, and has been removed from the charts; but there is a coral head of $3\frac{3}{4}$ fathoms about $3\frac{1}{2}$ cables S. 16° W. from Diego point.

Oronjia Pass.—Directions.—In bad weather the leading mark given at line 28, leads too near the rocks off cape Andranomodi, in passing which it is advisable to keep Nosi Langor in one with Windsor Castle, N. 78° W. At night keep Nosi Langor light on this bearing.

p. 72. **Tides.**—It is high water full and change at Port Nievre at 3h. 33m.; springs rise $6\frac{1}{2}$ feet, neaps $4\frac{1}{2}$ feet.

p. 73. **Coal.**—Supply appears uncertain. There was no coal, and very little patent fuel in store in August 1896.

Supplies.—Fresh meat and bread are plentiful.

Water.—The supply of water from the spring at point Diego is said to be abundant, and to be obtained without payment; but H.M.S. *Bona-venture* found fresh water very scarce in August 1896. The French ships use distilled water for drinking purposes.

Trade.—Communication.—See pages 4 and 5.

Antsirana.—The church with its tower was completely destroyed by the cyclone of 5th February 1894.

See chart, No. 1116, and plan of Oronjia pass, No. 1064.

Lights.—A *fixed red* light, visible 6 miles, is exhibited at the landing place on the north-west point of Antsirana. Another *red* light is shown at the jetty head, 2½ cables southward.

Storm signals are made from the flagstaff near the jetty; by day a *red* flag, at night a *red* light.

PORT NIEVRE.—The **Anchorage** is excellent and well p. 74. sheltered in convenient depths of from 4 to 10 fathoms, good holding ground. Ships may anchor with the Colonel's and Governor's houses in line, or Colonel's house in line with the military landing place, at a distance from the shore according to draught; large vessels outside the mooring buoys.

The Messageries Co. have established, off Antsirana, a red cylindrical mooring buoy for their vessels; there are also two mooring buoys for French men-of-war.

Light.—On an islet at the head of port Nievre, near the mouth of the river Maques, a local company have established a *red* light which is shown for the use of their steamers.

Green (Verte) island, on the edge of the shore reef, about 3½ miles p. 83. northward of Vohimao point, may be known by a grey sheet-iron building upon it, which forms a good landmark.

VOHIMAO BAY.—A signal mast, the top of which is 100 feet above the sea, has been established (1897) near the shore opposite the Residency at Vohimao point. The harbour master's flagstaff and the cemetery cross disappeared in 1896. Upon the hill or plateau about 2 miles S.W. by W. of Vohimao point, near a semaphore, a pyramidal beacon with spar top has been erected, the summit of which is 400 feet above the sea.

Buoys.—The following buoys were established in January 1897, viz. :—

- a. A conical buoy painted red, on south-east edge of reef at north side of channel.
- b. A conical buoy painted red with black bottom, at the south edge of the above reef.
- c. A barrel buoy painted black, on the north edge of the reef at south side of channel, extending from cemetery point. (Liable to drift.)
- d. A barrel buoy painted in red and black bands, on the south-east edge of the 5-foot bank, situated about 7 cables westward of the south entrance point.

See plan of Port Nievre, No. 1064; also plan of Vohimao bay, No. 679.

p. 84. **Directions.**—Approaching either from north or south steer parallel to the coast until the signal mast at the Residence is on with the pyramid beacon S.W. by W. $\frac{3}{4}$ W.; when the channel between the reefs will be well open, and may be steered for on this line. Round the reef off Vohimao point, which is steep-to at a moderate distance, keeping preferentially rather on this shore, as shoal water extends upwards of a cable from the northern reef. The reefs always break, and the colour of the water affords an excellent guide.

Anchorage.—Speed should be slackened well in time to ensure not running past the anchorage, which is rather towards the south shore in 11 fathoms, with the north-east point of Vohimao bay in line with cape Manambato, or with the Residency signal mast bearing S. by E. $\frac{1}{2}$ E. Small vessels can anchor farther in on either side of the buoy marking the 5-foot bank. The anchorage is well sheltered, and the water always smooth.

Trade and Communication.—*See page 4.*

p. 87. **VOHIMAO to SAMBAVA.**—The coast generally is safe to approach, there being deep water near it and no outlying dangers or extending reefs except for a short distance off the more prominent points, upon which the sea breaks continuously.

Amboaniho.—No semaphore has been erected upon the dark-coloured hill in the vicinity of Amboaniho; *see line 21.*

Cape Gouffres, 11 miles south of Vohimao, is a high steep cliff (against which the sea breaks), with detached rocks surrounding it at a short distance.

Cape Anorontani is a precipitous bluff of some elevation, with no rocks or reefs at its base. It is doubtful if there is good anchorage in the bay northward of the cape, at the west part of which there is a small isolated sugar-loaf hill.

The mountains and hills of this part are bare, and of a reddish aspect. There are but few trees near the shore, which, where not rocky, is mostly overgrown by brushwood. These characteristics are in contrast to the appearance of Vohimao; and also to the coast southward of the river Matainga, where there is much verdure, and an uninterrupted sandy shore, fronting a well-wooded country. It is only at points somewhat salient that reefs extend a short distance, which do not, however, constitute serious dangers. Mahanara hill is of little elevation, and difficult to distinguish when the weather is at all hazy.

Point Sambirano is somewhat marked, and a reef projects from it, apparently for half a mile. The country continues wooded, at the back of a sandy shore, all the way to Sambava.

Sambirano peak may be distinguished as being higher than any of p. 88. the surrounding hills; it is often concealed by clouds.

Antálaha point, though bare and low, may be recognised by a flag-staff and the Rova Hova established near it; a little distance northward there are a few huts, one of them with a grey roof. The reef extends only a short distance from the shore, but the anchorage here is quite open and can only be used in fine weather.

Tsiananga point, 5 miles south of Antálaha, has off it some p. 89. remarkable detached black rocks which rise to some height above the sea; they extend under water seaward for some distance, and should not be passed within the distance of a mile.

Ngonci or Ngontci road.—At line 28 and elsewhere, for “Ngonci or Ngontci,” read “**Angontsi** (Ngonci).”

ANTONGIL BAY.—Nosi Marosi.—At line 10, for “very,” p. 92. read “about 1,000 feet.”

Port Choiseul.—Maroantsetra is no longer an island, but is joined p. 93. to the tongue of sand forming Antsiraka point, which appears to have extended. There was no settlement at Maroantsetra in 1896, and the whole place is overgrown with vegetation.

A small vessel of 14 feet draught may find good shelter in a small cove situated north of Antsiraka point, but it would be necessary to buoy the passage leading to it.

In ordinary weather there is very good anchorage in about 7 fathoms mud, in the middle of Port Choiseul, but in bad weather shelter should be obtained under Nosi Marosi. To clear the shoal ground of Antsiraka point, keep the east side of Nosi Harami, touching the south-west extreme of Nosi Marosi.

At this anchorage the water is fresh on the surface and very muddy, and should not be used in the boilers if it can be avoided.

Tanjona, at the north side of the entrance of the river of the same p. 94. name, on the west shore of Antongil bay, is the head quarters of a French timber company, working a steam saw mill, and exporting timber, cabinet wood, &c. to Europe, Réunion and Mauritius in sailing vessels of 400 to 500 tons.

A chain of black rocks showing above water projects east and north-east for about 3 cables from point Tanjona at the south side of entrance, and

See chart, No. 758; also plan of Hastie road, No. 680.

for a less distance from point Concession at the north side. One of the latter rocks has its head painted white and is surmounted by a flagstaff upon which the French flag is hoisted.

Anchorage.—The trading vessels anchor north of Concession point, and ship their cargoes from a strongly-built wooden wharf erected for that purpose. Anchorage may be obtained outside the trading vessels, in 9 fathoms sand, with the flagstaff on the white rock bearing S. 15° W., and the mouth of a small river (Fanalaina) S. 76° W. On signs of bad weather vessels should leave this anchorage and take shelter under Nosi Marosi.

p. 98. **Larrée point.—Anchorage.**—The sandy shoals extend nearly half a mile eastward of Larrée point, and also from its north side until about one mile west of its extremity; the green colour of the water indicates their limit. Westward of this there is excellent anchorage in smooth water, with the wind from south-east, through south to west, whatever may be the force of the wind. The bottom is hard mud; depths, 16 fathoms at one mile from the shore, 10 fathoms at one cable.

p. 100. **PORT ST. MARY.**—None of the piers or bridges marked on the plan of port St. Mary exist, except the pier in front of the barracks, north of the church. There are (1896) also masonry piles, destined for a bridge between Madame islet and the land, but the piles only are there, and communication is carried on by a ferry. A flagstaff has been erected at the north extremity of Madame islet. There are two good berths at the quay, one at its north-east end for large ships; the inside berth has neither mooring buoys or chains.

The port is not considered safe for vessels in a cyclone.

p. 102. **Tides.**—For “2h. 15m.; springs rise 3 ft. 7 ins.,” read “4h. 0m.; springs rise 5 feet.”

p. 107. **Fénérive.—Tides.**—Erase time given of high water at Fénérive, which is not properly determined. At last line of footnote, for “vane,” read “wave.”

p. 109. **Mahambo.—The directions** given at lines 24–30 cannot be followed as the marks no longer exist, but the remarkable **Bitt** rock affords sufficient indication. This rock, which is well marked by breakers, and which is steep-to, should be rounded closely; the anchorage lies over towards the Bitt. Penelope's Pie should not be closed, as it extends for some distance under water, and is therefore dangerous. Anchorage inside the reefs is only practicable for small craft and coasters; larger vessels must remain outside exposed to the swell.

Foule point (Rafala) roadstead affords suitable shelter in ordinary p. 110. weather against the wind and sea from outside; it is open to north and N.E. winds, but these winds are generally of short duration, and do not raise much sea. The *Hugon* anchored in $5\frac{1}{2}$ fathoms, sandy bottom, with the east end of the village bearing S.W. by S., and the fort flagstaff S.W. by W. $\frac{1}{2}$ W., in smooth water.

There is good landing in the boat creek, at the south side of point Rafala; on the north side of the point, the shore is very flat, uncovers for a great distance, and landing can only be effected on men's backs.

Tides.—*Erase* time given of high water at Foule point, which is not p. 111. properly determined.

Marie Eugénie shoal.—The *Hugon* when steering S. 39° W. p. 113. direct for Prune island in April 1894, and 9 or 10 miles distant therefrom, passed over a shoal, the white bottom being seen quite plainly from both sides of the ship; no soundings were taken. This position, latitude $17^{\circ} 55' S.$, longitude $49^{\circ} 34' E.$, is almost identical with that given of a shoal reported in 1833 (*see* Islands in the Southern Indian Ocean, pages 112 and 114). Undoubtedly foul ground exists in this vicinity, where vessels should proceed with extreme caution.

TAMATAVE.—A flagstaff has been established on point Hastie for p. 114. signalling vessels. Improvements of various kinds are being carried out and contemplated at this port, including the construction of jetties lit by electric light, and sheds for storing purposes.

Trade and Communication.—*See* page 4.

Hospitals.—Since the occupation by the French, Military and Municipal hospitals have been built.

Tanio beacon is now painted in broad black and white horizontal bands.

Buoys.—A black buoy, with staff and ball, has been placed N. 76° E., p. 116. $4\frac{1}{2}$ cables from Tanio point beacon, to mark the edge of the shoal off that point. A black buoy has also been placed S. 36° E., $3\frac{1}{4}$ cables from the above beacon.

H.M.S. *Lapwing* in August 1896 found that the conical black buoy at the edge of the Great reef was not in position, and that a mooring buoy painted grey had been placed at the anchorage, in 13 fathoms.

Landing.—A beacon marks the edge of the reef round which boats pass to reach the landing, and off which the tide runs very strong.

Anchorage.—The holding ground, sand, in front of the town is not good. In bad weather better anchorage can be obtained in deep mud and

See chart, No. 7596 and plan of Tamatave, No. 688.

excellent holding ground, at about $1\frac{1}{2}$ cables west of the Great reef, with Tanio point bearing about west, and the Residency flagstaff in line with the east side of the dormer window of the red-roofed Tribunal.

p. 117.] **Directions.**—To line 33, *after* “Great,” *add* “reef; or the Residency flagstaff kept in line with the east dormer window of the French Tribunal. The latter may be distinguished by its red roof visible above the Residence, and partly hidden by a large tree.”

p. 118. **Tides.**—It is high water, full and change, at Tamatave at 4h. 18m.; springs rise 8 feet.

p. 122. **Nosi Faho** is a very low sand islet without a trace of vegetation, and is surrounded by a reef upon which the sea always breaks.

NOSI DOMBALA.—The reef encircling the island appears to extend for 6 or 8 miles, especially towards the north-east.

Bank.—A shoal bank runs from Nosi Dombala for about 5 miles in the direction of Nosi Faho, where characteristic discoloured water was observed by the *Huron*. Upon this bank there are depths probably less than 5 fathoms; vessels, therefore, should not pass between the islands.

Anchorage.—The passage inside these islands was made several times by the *Huron*, which vessel reports it to be free of danger. Anchorage was found westward of Nosi Dombala and Nosi Fonga, where there is good shelter and smooth water.

p. 123. **Vatomandri Saddle.**—At line 33, *after* “saddle” *read* “about 2,000 feet above the sea.”

p. 124. **Vatomandri.**—The two remarkable trees (*see* line 6) no longer exist; a two-storied red-roofed house in the centre of the group of houses, and higher than all the others, is the most conspicuous object. The northernmost of the black rocks is conical in form, and the higher of the two.

Trade.—*See* page 5.

Shoal.—The captain of the French ship of war *Hugon* examined this shoal (*see* line 9) in 1896, and found it to extend about 3 cables east and west, with a breadth of 2 to $2\frac{1}{2}$ cables; the depths upon it are 5 to 8 fathoms, and it is steep-to on the land side. There is deep water to the southward between this bank and the two outer reefs awash.

The two-storied house bearing from W. $\frac{1}{4}$ N. to W. $\frac{1}{4}$ S. marks the outside limits of the shoal, which should be avoided, as there may be lesser depths upon it.

See chart, No. 759b, and plan of Vatomandri, No. 1036.

Anchorage.—From an anchorage in 8 fathoms, at $3\frac{1}{2}$ cables N.E. by N. of the conical black rock with the two-storied house bearing W. $\frac{1}{2}$ S., the south side of the western reef awash was in line with the north side of the outermost reef, bearing S.E. $\frac{1}{2}$ E.

Landing should not be attempted in ships' boats, but the decked p. 125. native craft will come off if signal for them is made by International Code. Communication with the shore is frequently interrupted.

The Coast.—Reefs have been reported to exist at from 2 to 5 miles p. 126. south-eastward of Vatomandri. At line 17, *after* "summit," read "1,760 feet above the sea."

Vaudreuil rock.—The *Conway Castle* was stranded upon this bank in 1893; the wreck still remained in 1896, and could be seen for some distance.

Mahanoro.—Search was made in 1895 for the bank said to exist 3 miles N.E. of Mahanoro fort, but $7\frac{1}{2}$ fathoms was the least water found in the assigned position. Landing in ships' boats is dangerous at Mahanoro, except in very fine weather.

MAHELA.—**Gabrielle Shoal.**—The French Government has p. 130. given notice that the master of the schooner *Gabrielle* reports the existence of a shoal, on which he obtained soundings of $3\frac{1}{2}$ to 8 fathoms, situated about 6 miles off shore, between Maninzari and Mahela—approximate position to be considered doubtful—lat. $21^{\circ} 43'$ S., long. $48^{\circ} 36'$ E.

MANINZARI, at the mouth of the river Mananjara, where there p. 131. is a group of European houses, is one of the busiest ports on the east coast, standing on a shore of very white sand; there are several flagstuffs which show up, and at the north end of the town some high trees which form a good mark from seaward. There is no fortification or garrison (1895).

Trade.—See page 5.

Anchorage.—In fine weather temporary anchorage may be taken by a steam vessel near the opening in the reef, where there is a depth of 7 fathoms, at the distance of $1\frac{1}{2}$ cables. The passage through the reef, in which there is 12 feet water, is in front of the high trees; it is nearly always practicable, though difficult with strong north-east winds.

Inside, the river with 15 to 20 feet of water forms a good port; the stream, however, rapidly shoals, and is navigable only by canoes.

There is always considerable swell in the roadstead.

The Coast.—At line 4, *after* "hill," read "about 1,050 feet in p. 132. height."

Faraoni river.—A line of reefs awash upon which the sea breaks heavily extends for several miles in front of the entrance to this river, through which two channels, with about 16 feet water, lead to an anchorage within the reefs, where there is said to be 19 feet. These channels are dangerous, except in very fine weather, and are used only by decked lighters.

The outer roadstead has indifferent holding ground of sand and coral.

p. 133. **The Coast.—Ranambo reef.**—The openings shown on the chart are impracticable for ships, the sea breaking right across them. There are passages, however, towards each end of the reef, but that at the south is available only for the decked sloops of the country. Sailing vessels of 300 to 400 tons visit the anchorage inside for cattle.

p. 134. **Farafangana village.**—North of the village, at the mouth of the river, and close to the sea, there are two European storied houses, with flagstaffs, which are very conspicuous; at the south extremity stands a house with reddish roof, and close to it, an enormous round tree, the only one visible for a considerable distance.

Trade.—See page 5.

Discoloured water has been reported to extend about 14 miles in a southeasterly direction from the village of Farafangana, and was observed (1897) in latitude $22^{\circ} 50' S.$, longitude $48^{\circ} 12' E.$ It is possible that this may have been river flood water.

p. 136. **The Coast.**—At line 12, for “6 or 7 miles,” read “about 16 miles.”

Ekiena, in lat. $23^{\circ} 25' S.$, is a village where there is a landing-place; it is situated about one mile southward of the entrance to a small river.

River Masianaka.—The entrance to this river is in about lat. $23^{\circ} 32' S.$, and may be known by the village of Anositrombi near its mouth, at which there is landing. *Erase* “Vessels” at line 19, and also “the four lines following.”

Manambondro is in lat. $23^{\circ} 47' S.$, and about 16 miles from Masianaka.

p. 138. **Aspect of the Coast.**—At line 3, after “hill,” read “about 1,900 feet in height”; at line 19, for “Iavibola,” read “Manantina”; and at line 21, for “S.E. $\frac{1}{2}$ E.,” read “E. $\frac{1}{4}$ S.”

Tsiomaro (Choumare) reef.—At end of line 26, *add* “Discon- p. 140.
nected rocks, some above water, continue from this reef to the north-east
point of Mananivo bay.”

FORT DAUPHIN.—The population in 1895 was about 2,500, p. 141.
including 8 Europeans. Fish, fruit and poultry are plentiful, but beef is
scarcely obtainable. The water supply is good.

The Europeans state that the climate is healthy.

Trade and Communication.—*See* pages 5 and 6.

Mount Andrahomanana, standing near the sea, about 6 miles p. 143.
westward of Galleon bay, is about 1,400 feet in height, and presents the
appearance of a blunt cone of a brown colour. It is conspicuous, and the
principal landmark of this part of the coast.

Discoloured water.—The Italian barque *Oreb* reported that in
May 1891, being off the south east coast of Madagascar, in lat. 26° 25' S.,
long. 52° 27' E., she passed through two patches of highly discoloured
water. No soundings were taken.

CHAPTER III.

Glorioso Islands.—These islands were annexed by the French in p. 148.
August 1892.

Port Liverpool.—**Tides.**—It is high water, full and change, at p. 155.
Port Liverpool at 4h. 17m.; springs rise 8 feet.

The Coast.—At line 6, *for* “2,” *read* “3”; and at line 10, *for* p. 156.
“Nosi Pahanesi,” *read* “Nosi Pahanji.”

Windsor Castle.—At line 4, *for* “1,284,” *read* “1,289.” p. 157.

Nosi Anjombavola.—At line 12, *after* “rocks,” *read* “At about p. 159.
3 cables south of Nosi Anjombavola, in the passage between it and Pointu
rock, there is a patch upon which the depth is only 15 feet.”

Ambatoarara hill.—At line 18, *for* “700,” *read* “631.” p. 160.

Courrier bay.—*For* “lines 24 to 28,” *substitute*: “At half a mile p. 162.
northward of the south point of Courrier bay, there is a bank nearly
4 cables in diameter, upon which there is a depth of 9 feet, and at its
southern end a coral rock that uncovers; the water appears yellow. At
2 miles E. by N. $\frac{1}{2}$ N. from the above point, and nearly a mile from the
east side of the bay, stands a small islet, 33 feet high, between which and

See charts, Nos. 760 and 1002.

the shore the depth is only 9 feet ; a small patch, with 15 feet water over it, lies half a mile north-west from the islet."

Anchorage.—At line 31, *for* "The best position, &c.," to "muddy bottom" at line 38, *read* "The best position will probably be found at about 3 cables S.W. by S. to S.S.W. from the small islet."

p. 163. **Ambararata bay.**—At line 21, *after* "Ankitikona hill," *read* "881 feet in height."

pp. 164,
165. **Nosi Hara.**—**Directions.**—*Cancel* "last seven lines of page 164, and first three lines of page 165."

p. 165. **Anchorage, &c.**—At line 17, *for* "port," *read* "part" ; at lines 24 and 31 *for* "Irognono," *read* "Ironono."

BEFOTAKA BAY.—**Shoal on west shore.**—The commander of the French Government ship *Sagittaire* reports the existence of a shoal, locally known as *Andriva Rangotro*, lying on the west shore of Befotaka bay. This shoal is about one mile long in an east and west direction, and half a mile broad ; there are several patches on it with less than 3 feet water on them, and from the depth of 10 feet near the edges, the water quickly deepens to 10 and 11 fathoms ; one head, near the centre of the shoal, is awash at low water.

Approximate position of centre, lat. $12^{\circ} 26' 30''$ S., long. $48^{\circ} 54'$ E.

p. 168. **NOSI VALIHA.**—**Shoal.**—The French Government has given notice, that the Master of the Messageries Maritimes steam-vessel *Yang tse* reports that at 5 p.m., 6th April 1895, that vessel touched upon a shoal spot lying with the north point of Nosi Valiha bearing about N. 67° W., distant $1\frac{1}{2}$ miles.

Position (doubtful), lat. $12^{\circ} 22\frac{3}{4}'$ S., long. $48^{\circ} 44\frac{1}{4}'$ E.

p. 169. **Kalomisampa islet.**—At line 4, *for* "half a mile," *read* "one and a half miles."

p. 172. **Directions.**—At lines 26 and 27, *for* "is free from danger, but," *read* "however has but 3 fathoms on the flat joining Nosi Vori to the mainland, and."

p. 173. At line 34 and elsewhere, *for* "Andya-ku," *read* "Andiako."

p. 174. At line 17, *for* "Sahiguana," *read* "Sahinana."

p. 175. **Minow islands.**—At line 20, *for* "22 miles," *read* "15 miles."

p. 178. **NOSI BÉ.**—**Mount Lokobe.**—At line 20, *for* "2,000 feet," *read* "1,263 feet."

Buoys.—The *white* buoy marking the extremity of the reef off p. 179. Mahatinzo point, and the *white* buoy on Ampombilava reef, have been withdrawn. There is a mooring buoy at Hellville for the steamers of the Messageries Maritimes.

Signals.—A vessel's arrival is reported from the look-out signal station at Mahatinzo point, by a ball being hoisted below a pennant.

Tani-Keli Light is reported (February 1897) to work irregularly, and occasionally to go out.

Hellville.—Tides.—It is high water, full and change, in Hellville p. 182. road, at 4h. 29m.; springs rise 14 feet, neaps 8½ feet.

Trade.—Communication.—See pages 5 and 6.

Erdwin bank.—At lines 4 to 6, *for* "There is also a patch with p. 185. 3½ fathoms over it at a mile north-east of the 2-feet shoal, and another with 4½ fathoms at 2¼ miles in the same direction," *read* "There is also a patch with 3 feet water over it at 2½ miles E. ½ N. from Nosi Fanihi, and N.W. by N. from Ampahofaho point, situated in the middle of the south side of Erdwin bank, which is 1½ miles in length, with a breadth of half a mile."

North-east rock.—At line 12, *for* "10 to 13 feet," *read* "3 feet."

Nosi Komba.—At line 3, *for* "1,800 feet," *read* "2,054 feet." p. 186.

Tafudru point.—Buoy.—At line 11, *after* "stands," *read* "A shoal flat extends 6 cables to the south-east and south from Tafudru point, the south-east edge of which is marked by a black buoy. The navigable channel, 2½ cables in width, lies between Nosi Vauru and Tafudru flat. There is a 2½ fathoms patch, one quarter of a mile W.S.W. from Nosi Vauru, and another, with the same depth over it, lying 1¼ miles W. by N. ½ N. from the lighthouse."

Vatu Ranu rock.—At line 21, *for* "is steep-to" *read* "which has shoal ground of 2½ fathoms extending northward from it for 3 cables."

Ambavatobi (Dalrymple) bay.—Leading mark.—At p. 189. line 17, *for* "S. 7° E.," *read* "S. ½ E."

Vestal reef.—Shoals.—At line 24, *for* "and Karakajoro for," p. 191. *read* "and Kalakajoro, consisting generally of coral patches with depths under 4 and 5 fathoms, and extending in places to 12 miles from the mainland, for."

Kakambana bay.—This bay lies between Andrahibo point, a narrow tongue of land having on it three hillocks covered with trees; and Antangena point at 2½ miles W. by S. from it. Coral reefs which are invisible at high water extend seaward 6 cables from Andrahibo point, and also project that distance from the south shore of the bay eastward of Antangena point, greatly reducing the space available for anchorage.

p. 192. **Coral patches.**—At line 10, *for* “many shoals nearly level with the water, standing up from,” *read* “two coral patches lying 2 miles N.W. by N. from the mouth of Baramahamai river, the outer one with only 3 feet water over it, which have near them.”

p. 193. **Passage.**—At line 2, *for* “over a mile wide,” *read* “rather more than half a mile wide between the 5-fathom contours.”

Outer shoals.—At line 18, *for* “lies 12 miles to the westward of Nosi Mbalila with $4\frac{1}{4}$ fathoms over it;” *read* “lies 17 miles W. $\frac{1}{2}$ S. from Nosi Valiha (Mbalila) with $3\frac{3}{4}$ fathoms over it;” and at line 24, *after* “north,” *read* “Some of these patches of $2\frac{1}{2}$ fathoms lie 4 miles W.S.W. from Kalakajoro, and have lesser depths between them and Nosi Fali, lying 7 miles to the southward.”

Vaudreuil bank, lying midway between the north part of Berofia and the mainland, is nearly 3 miles in length north and south, and 4 cables in width; towards each end there are rocks nearly awash but the bank is broken at the centre for nearly half a mile by deeper water. From the north end of the bank, Kalakajoro north extreme lies W. by N., and is distant $3\frac{3}{4}$ miles; Berofia north extreme bears from this position S.W. by W. $\frac{1}{2}$ W.

p. 194. **Rafaralahi Bay.**—At line 36, *for* “ $2\frac{1}{2}$ miles,” *read* “ $3\frac{1}{3}$ miles.”

p. 196. **General Directions.**—At line 9, *for* “4-fathom bank,” *read* “ $3\frac{1}{2}$ -fathoms bank”; and at line 12, *for* “creek and rounding,” *read* “creek and keeping clear of the $2\frac{3}{4}$ -fathoms patch lying eastward of Vestal reef, and rounding.”

The creek to the southward of Andranto Custom-house, *see* lines 19 to 25, should only be entered by a small vessel having local knowledge.

PORT RADAMA.—The bay has not been thoroughly examined, and should be approached with caution; there is a large extent of anchorage ground where good berths may be selected, but probably shoals exist other than those at present known and charted.

Verte islet, situated southward of Ankatafa, is flat, very wooded, with a remarkable cluster in the centre, and is surrounded by reefs.

Directions.—To enter Port Radama, a vessel having passed Kalakajoro should keep about 5 or 6 cables from the east side of Berofia island, and upon the hill (200 feet high) on Berangomaina point bearing S.E. by S., steer for it until Verte island is in line with the south slope of Ankarami mountain E. by S. $\frac{3}{8}$ S., when preserve that transit till Berangomaina hill bears south. Then steer carefully S.E. by E. up the estuary between the flat extending nearly $1\frac{1}{2}$ miles from the south shore

and the patches of $2\frac{3}{4}$ and $2\frac{1}{2}$ fathoms situated respectively S. by W. $1\frac{1}{4}$ miles and S.S.E. 2 miles from Verte islet, until the conical hill of Ambolibozo bluff, 236 feet in height, bears S.S.W. A very red patch will then be seen bearing S. by E., in line with the left declivity of a height in the shape of a horizontal table, which belongs to the mass of a flat-topped elevation reaching 993 feet above the sea. Follow this line until the summit (590 feet high) of the peninsula is seen in one with point Ambolibozo (rocky and surmounted by some mangroves) bearing S.W.; when steer for that point, leaving 9 cables to the north-west the coral flat situated north of it, which is somewhat extensive and uncovers $5\frac{1}{2}$ feet.

Anchorage may be taken in from 8 to 12 fathoms, at about 3 to 6 cables, or at any convenient distance, off Ambolibozo point; but the space near the ship should be carefully sounded, the place not having been fully surveyed. Anchorage may also be obtained in about 10 fathoms with Ankarami peak bearing E.N.E. and the conical hill of Ambolibozo bluff S. by W.; or if not desirous of proceeding so far up the harbour, a convenient berth will be found in a depth of about 9 fathoms, with Berangomaina hill W. $\frac{1}{2}$ S., distant 2 miles, at a distance of 7 cables from the shore.

Raminitok bay.—At line 30, *for* “15 miles wide and recedes p. 197. 9 miles,” *read* “9 miles wide and recedes 7 miles.”

Nosi Shaba.—At line 25, *for* “west side and 3 miles to the south- p. 198. west,” *read* “north and west sides.”

SHOALS.—The **Lyra bank**, situated midway between Nosi Shaba and Nosi Lava, is composed of coral, and within the depth of 5 fathoms is more than one mile in extent; its shoalest part, a small patch of $2\frac{1}{2}$ fathoms, lies $3\frac{1}{4}$ miles S.S.W. $\frac{1}{2}$ W. from the south-west point of Nosi Shaba.

Upon the ridge of shoals lying 7 to 10 miles westward of Lyra bank, there is a coral patch of 3 fathoms one mile within its western edge; this patch is in latitude $14^{\circ} 26' S.$, longitude $47^{\circ} 28' E.$

NOSI LAVA.—At $1\frac{1}{10}$ miles S.W. of the south-west point of this p. 199. island are two isolated rocks, which uncover 3 and 5 feet at low water. Nosi Soi summit in line with Marotaolana, S. $46^{\circ} E.$, leads clear of these rocks.

Nosi Soi.—At line 3, *for* “200 feet,” *read* “279 feet.” p. 200.

RIVER ANTAMBO.—The banks of the river were formerly covered with villages, now destroyed or abandoned; the country appears rich, but at present (1896) it is altogether uncultivated. The approach

and entrance to the river present no difficulty, even for large ships; it is sufficient, generally, to keep in mid-channel between the banks. The depths are great in the river, but the stream is not strong enough to be troublesome. A bank, which is visible, extends some distance from the shore near the south entrance point.

The point on the south bank at the sharp bend about 4 miles within the entrance is covered with thick vegetation; it is steep-to and must be rounded rather closely to avoid a sand-bank off the stream in the bight of the north shore. Hence keep the middle of the river to the entrance of the inland waters of Panantsova, situated at about 10 miles from the sea, after which the navigation becomes more difficult.

Care must be taken to avoid a rocky bank, of which one head uncovers, extending $2\frac{1}{2}$ cables from the north bank, and situated at a point $2\frac{1}{2}$ miles north-east from Loza peak. The point on the south bank situated nearly 2 miles E. by N. of Loza peak is rocky and steep; N.E. by E. of this latter upon the north bank, is the entrance point of the inland sea. In the triangle formed by these three points there are depths of from 8 to 10 fathoms where a large ship may anchor.

The inland waters have only been partially sounded, but 6 fathoms were found by passing a few hundred yards northward of the island on the south shore; thence 5 fathoms were carried until past the projecting point eastward of the island. Both shores of the sea are low and bordered with mangroves.

Anchorage will be found north-west from the mouth of the river in 8 to 10 fathoms water, at a convenient distance from the shore, with Nosi Lango bearing about W. $\frac{3}{4}$ N.

Tides.—It is high water, full and change, at Nosi Lava at 4h. 20m.; springs rise $11\frac{1}{2}$ feet, neaps $8\frac{1}{2}$ feet.

LOZA PEAK, 725 feet high, is remarkable.

p. 201. **MAROTAOLANA** is very remarkable, and is the northern extremity of a wooded chain on the east coast of Narendri bay; in line with the north end of Nosi Soi, bearing S.E., it clears the outer shoals.

DIAMOND BANK is $7\frac{2}{10}$ miles, N. 87° W., from Maromoni point, and $3\frac{3}{4}$ miles distant from the nearest shore; its shoalest head lies with Maromoni point nearly in line with Loza peak.

MAROLAHİ POINT should be given a wide berth on account of the reef which extends off it, the outer heads of which uncover at low water. The coast between Maromoni and Marolahı points should be passed at a distance of over 2 miles, to avoid a $4\frac{1}{2}$ -fathoms patch about

See chart, No. 704.

5 miles north-eastward of the latter point. Nearly 2 miles N.E. of Marolahi point is a remarkable parasol tree. Inland 17 miles south is False Table hill, in the shape of a flattened cone, 719 feet high.

A coral bank of $3\frac{3}{4}$ fathoms lies 9 miles W.N.W. from Marolahi point.

Moramba bay, situated 18 miles south-west of Maromoni point, is p. 202. only suitable for small vessels; a bank stretches across the entrance from shore to shore upon which there is less than 15 feet.

Anchorage.—At line 31, for “at about 10 miles from the shore,” read “generally between the outer reef and the shore.”

Outer reef.—From Narendri bay until abreast of Ambatomifoko point the outer reef is continuous; there is no passage through.

Opposite Mahajamba bay are two passes, Grand pass and North pass, separated by a coral plateau with two shoal heads of $4\frac{1}{2}$ and 6 fathoms; the Grand pass is the safer and broader, with not less than 10 fathoms in it. A bearing of Masiaposa will take a vessel through.

MAHAJAMBA BAY.—In approaching Mahajamba from the p. 203. northward through the Grand pass, Masiaposa, or Table hill, 705 feet in height, is the first and best defined object seen, and appears as a wooded plateau, and then 8 miles E. by N. $\frac{1}{2}$ N. from it, False Table hill, similar in appearance and height will be made out. To the westward, the plateau of Ambararata will be recognised, and, if the sun is shining on them, two rows of red cliffs near it; in the rainy season, a large waterfall in the western row may be visible, which is a good mark for entering the Grand pass.

Ambohitsambo, 606 feet high, and Antranonaomoi are distinguished by their rugged outline.

Ambatomifoko point is rocky, and shoals extend off it for one mile; also a sand bank, with about $4\frac{1}{2}$ fathoms on it, lies outside this for $3\frac{1}{2}$ to 5 miles in a northerly direction, and extends to the westward for 4 miles with a depth of but $3\frac{3}{4}$ fathoms. This point should be given a good berth.

Manakara point.—Just south of this point is a remarkable white patch which shows up well in the afternoon sun, and is useful in navigating the West channel.

Ambararata cliffs.—There is at these cliffs a remarkable detached sugar loaf 374 feet in height and crowned with trees, a bearing of which leads through the West channel.

Thetis bank has only $1\frac{1}{2}$ fathoms on it, and is very steep-to.

Intermédiaire bank is composed of sand and coral about 3 miles in length, with $2\frac{1}{2}$ fathoms least water near its south-eastern end.

See chart, No. 377, and plan of Mahajamba bay, No. 702.

Lyra bank is a large coral plateau $2\frac{1}{2}$ miles in length, with $3\frac{1}{4}$ fathoms least water on it.

Directions.—Coming from the northward through the Grand pass, steer on a bearing of Masiaposa and alter course as requisite for the entrance of the bay. Entering from the westward, the passage between Lyra and Intermédiaire banks has no good leading marks, and further, there is a patch of 4 fathoms in the middle of this channel. The quickest way to reach the bay and that which avoids the sea raised by S.E. winds, is between Intermédiaire and Thetis banks. To make this passage, steer with Masiaposa in line with Manakara white patch, S. 73° E., until Ambararata sugar loaf bears S. 60° W., when bring it astern, and keep it on that bearing until Ampasilava point bears S. 11° W., when the course can be altered for an anchorage in the bay.

Anchorage.—The soundings both in the lower and upper part of the bay are irregular, and the upper part is imperfectly known; every precaution, therefore, should be taken in navigating its waters. There are several anchorages. Vessels may anchor with good protection from S.E. winds in the West channel in 7 fathoms, mud, 3 cables from the shore, or in a similar depth sheltered from N.W. winds, 4 cables from the shore on the east side of Ambararata point, where fresh water can be obtained. The anchorage off the river Ambenja in 7 fathoms, mud, $3\frac{1}{2}$ cables from shore, with Ampasilava point bearing N. 6° W., and the sandhill S. 71° W., affords complete protection from N.W. winds, but it must be approached with caution by vessels drawing more than 17 feet on account of the shoal flat to the south-eastward. There is excellent anchorage off Mangoaka in 5 fathoms, mud, 7 cables from the shore, with outer islet off point Amboliboza in line with point Amboaniho, and Masiaposa bearing N. 75° E. Ambenja is the principal village.

Although the inner bay has the larger part of its area occupied by very shoal water, there is a considerable space where good anchorage may be found in from 6 to 8 fathoms. In 1897 it was reported that the depths are $1\frac{1}{2}$ to 2 fathoms less than those given in the charts.

Supplies.—Mangoaka and the village to the south-east of it are the only places where cattle can be obtained cheaply; poultry may be procured at Andranomena and Ambenja.

Water can be obtained pretty easily from a reservoir at the mouth of a rivulet at Ambararata point.

p. 204.

Tides.—It is high water, full and change, at point Ambararata at 4h. 30m.; springs rise $11\frac{1}{4}$ feet, neaps 8-feet.

See charts, Nos. 377 and 702.

OUTER SHOALS AND PASS.—Boursaint bank.—

The depth on this reef is about 3 fathoms on the southern part lying N.W. by W. $\frac{1}{2}$ W. 15 miles from Ambararata point.

Vigilant bank has 3 fathoms least water on it. Between the Boursaint bank and the Vigilant bank is the **Namakia** passage. To go through this passage a good look-out must be kept, and position ascertained by bearings of the land.

Romanche bank.—The least water found on this bank is 2 fathoms, but as the depths are very irregular less water may exist.

Forfait bank has $3\frac{1}{4}$ fathoms on it, the **Vaudreuil bank** $3\frac{3}{4}$ fathoms least water on it, both being on a large coral plateau. Between these two banks and Romanche bank is the **Tsimanenoakoho** passage.

Tsimanenoakoho passage can be recognised from seaward by being nearly opposite a very marked dip (the first after passing Mahajamba) in the hills which border the coast, and the red cliffs of Komani, which appear as a broad red horizontal patch, striped with black vertical lines. Sarodrano, a yellowish plateau, standing 417 feet above the sea, and crowned with a rather remarkable green clump of trees, bearing S. 13° E., leads through this passage.

Mariner bank has two shoal heads of $3\frac{1}{4}$ and 4 fathoms. Between p. 205. the Mariner and Forfait banks is the Andranolava pass.

Andranolava pass is about $2\frac{1}{2}$ miles in breadth. It should be entered in the afternoon when the cliffs of Komani and Ampajoni are visible, as a bearing of one of these is necessary to take a vessel through.

Euryalus bank has two heads of $4\frac{3}{4}$ and 5 fathoms. Vessels should avoid it.

AMPAJONI PASS is between Euryalus and Mariner banks. In its centre is a patch of $5\frac{1}{4}$ fathoms which should be avoided, as, though carefully examined, there may be less water.

The only points visible outside the pass are the bluffs of Ampajoni and Katsépé, which appear like islands separated from each other by a broad opening; they are distinguished by their red cliffs, the former being very easy to recognise.

Vessels should enter the pass on a bearing of one of these.

Buoyage.—The undermentioned buoys were formerly placed in Ampajoni pass, northern approach to Bombetoke bay:—

- a. A black buoy, in a depth of $3\frac{3}{4}$ fathoms at low water, on the western side of Mariner bank, or approximately in lat. $15^{\circ} 23' 50''$ S., long. $46^{\circ} 19' 40''$ E.

b. A *can* buoy, painted red and black in horizontal stripes, on the bank in the middle of Ampajoni pass, in approximately lat. $15^{\circ} 24' 20''$ S., long. $46^{\circ} 15' 15''$ E.

By information, dated May 1898, both buoys were non-existent; they appear not to have been in place for two years.

Turquoise bank is a large coral plateau, with two heads of $4\frac{1}{2}$ and $4\frac{3}{4}$ fathoms.

Katsépé pass between the Euryalus and Turquoise banks cannot be recommended, as it has two coral banks of $6\frac{1}{2}$ and 5 fathoms in its centre.

Makambi pass is formed by the Turquoise bank on the north, and a coral bank with 5, $4\frac{3}{4}$, and 4 fathoms on it, extending for about 12 miles to the south-westward. This passage is only $1\frac{1}{2}$ miles wide, but the centre of Makambi island kept on a bearing of S. 26° W. will take a vessel through in not less than 11 fathoms.

Cavalier bank, with its south edge lying about 3 miles from the coast on the west side of Bombetoke bay, extends N.W. by W. 8 miles, and north 6 miles from its shoalest depth of $1\frac{3}{4}$ fathoms, situated at its south-east extreme; and which bears N.W. $\frac{1}{3}$ N., $5\frac{1}{2}$ miles from Ampangataha point. A deep enters the bank from the south-east side nearly dividing the shoal in two; the least depth on the north part is $3\frac{1}{4}$ fathoms; in the middle of the southern portion there is but $2\frac{3}{4}$ fathoms.

A black buoy that had been moored off the south-east end of Cavalier bank, was not in existence in May 1898.

Narcissus bank.—There is only $1\frac{1}{2}$ fathoms on this bank.

A red buoy is moored in 3 fathoms water at the north-west edge of Narcissus bank.

Andriana shoal.—At $3\frac{3}{4}$ miles N.W. $\frac{3}{4}$ W. from Ampangataha point, a coral shoal projects $1\frac{1}{2}$ miles from the shore, near the village of Andriana.

A buoy, painted red, has been moored on the north edge of shoal water, marking the south limit of the west channel into Bombetoke bay.

p. 206.

BOMBETOKE (Bembatooka) bay.—The Kandrani hill, about 312 feet in height, has a well-defined summit on coming from the northward. The tree on Katsépé bluff, 374 feet above the sea, is remarkable. The hill Rova is covered with mango trees, and has on it a white building, used as a military pigeonry, with a bell-turret on its

The offing buoys are not to be depended upon. They often show uniformly white in consequence of a deposit of guano.

See chart, No. 138.

zinc roof, which is conspicuous over the trees. It is connected with Anorombato fort, which is easily made out. Ambondro hill is also covered with mango trees. At Point de Sable is the signal staff of the harbour authorities, 69 feet above the ground, to the eastward of which is a small jetty. Upon Ile Verte a white beacon surmounted by a triangle has been erected, which is better seen in the afternoon.

Antsahambingo rock, lying N. 14° W. $1\frac{1}{4}$ miles from Anorombato point, has $2\frac{1}{2}$ fathoms on it.

A **buoy**, painted black, is moored on the north-west side of Antsahambingo rock.

Buoyage.—The following buoys have been placed in Bombetoke p. 207. bay:—

- a. A buoy painted black in 5 fathoms, at 3 cables S.W. $\frac{3}{4}$ W. from Anorombato point.
- b. A buoy painted black in 5 fathoms, at 3 cables W. $\frac{1}{2}$ N. from Sable point.
- c. A buoy painted with black and white horizontal bands in 6 fathoms, at $1\frac{1}{10}$ of a mile W. $\frac{3}{4}$ S. from Anorombato point.
- d. A buoy painted black in $3\frac{1}{2}$ fathoms, at $1\frac{2}{10}$ of a mile W. by S. from Sable point.
- e. A buoy painted black in 6 fathoms, at $1\frac{1}{10}$ of a mile W. by N. $\frac{3}{4}$ N. from Antanandava point.
- f. A buoy painted black in 4 fathoms, at $1\frac{0}{10}$ of a mile E. by S. $\frac{1}{2}$ S. from Maroloha point.
- g. A buoy painted red in 5 fathoms, at 9 cables S.S.E. $\frac{3}{4}$ E. from Katsépé point.
- h. A buoy painted red in 5 fathoms, at 9 cables, S.E. $\frac{3}{4}$ E. from Maroloha point.

Channels.—There are three channels for entering.

p. 208.

The N.E. channel is navigated by keeping Kandraui bearing S. 43° W., when the houses of Mojanga come in sight clear of Anorombato point, the Antsahambingo rock will be passed; haul up for the anchorage when Ile Verte (Nosi Beza) bears S. 33° E.

Entering by the North channel, bring the summit of Katsépé to bear S. 24° W., and keep it so until East point bears S. 2° E., and steer on that bearing until Ile Verte bears S. 33° E., as before, and proceed to the anchorage on that bearing.

By the N.W. channel, keep the east extreme of the Katsépé coast between the bearings of S. 3° E. and S. 18° E. to pass between the Cavalier and Narcissus banks, until the east point of the bay bears S. 16° E., which should then be steered for. When the last houses of

See plan of Bombetoke bay, No. 701.

Mojanga bear S. 44° E., they should be steered for until Ile Verte bears S. 33° E., when proceed to the anchorage on that bearing.

Vessels of light draught might also pass through the West channel between Cavalier shoal and the coast, by keeping the centre of Ambondro hill bearing S. 70° E. This will lead through in not less than 4 fathoms at low water.

MOJANGA.—Anchorage.—Proceed with Ile Verte bearing S. 33° E. until Rova white house comes in line with the sandy point bearing about N. 31° E.; a ship will then be in about 5 fathoms; haul up for the sandy point, and anchor according to draught with stiff mud bottom. The tides are strong at this anchorage, the ebb attaining 3 knots at springs, but the closer a vessel can anchor to the shore the less she will feel them.

p. 209. Vessels wishing to anchor farther up the bay off the delta of the Betsiboka, will find a convenient anchorage and good muddy bottom. After leaving the anchorage off Mojanga, stand to the westward to avoid the shoal water extending northwards from Ampirimpirina point, and clear it to the westward by a bearing of Maroloha point; proceed down the channel to the southward on a bearing of that point, and when Antanandava point bears east, turn to the eastward, and anchor where convenient.

Tides.—It is high water, full and change, at Mojanga at 4h. 45m.; springs rise $12\frac{1}{2}$ feet, neaps $8\frac{3}{4}$ feet. At the anchorage for large vessels the streams run at springs, flood 2 knots, ebb 3 knots.

p. 210. **Trade.—Communication.**—See page 5.

Telegraph.—Mojanga is connected with Mozambique by cable, from whence communication can be made to all parts of the world.

p. 211. **River Betsiboka.**—The delta of this river is covered by an immense belt of mangroves which is intersected by numerous streams, which discharge into the bay. There are three principal mouths, Mahabo or Kandranikeli on the west, Morakari in the middle, and Manana or Ambatokeli on the east. The Manana is the principal channel for entering. Although as far as the north point of Nosi Lava nothing less than 2 fathoms has been found, yet the channel is so subject to frequent changes from freshets, that it should not be used by those unacquainted with it, except at high water, and after buoying. Boats should take the channel running along the east shore, where they will be protected from the S.E. winds, which often blow strong and raise a heavy surf.

The banks being bordered by mangroves, no good landing will be found before reaching Maévarano. Above Maévarano, sand banks cause the channel to be deflected from one bank to the other, and sometimes they lie

See plan of Bombetoke bay, No. 701.

right across, thereby reducing the depth. The mangroves cease where the small river Andra Nolava joins, but the banks still continue wooded. About 8 miles from Maévarano the river Marovoai (so called because it swarms with crocodiles) enters the main stream. The breadth of this river is from 20 to 30 yards, and has the appearance of an artificial canal. The depth is from one to two fathoms, and it is clear of shoals. As far as Mahatsinjo the banks are wooded, but from there to Marovoai the country is almost bare, and admits of easy landing at high water.

The Betsiboka is said to be practicable for small steamers as far as Suberbieville 200 miles from the coast, for 9 months in the year.

Tides.—It is high water, full and change, at Maroloha point at 4h. 57m. Springs range $14\frac{3}{4}$ feet, neaps $6\frac{1}{4}$ feet. As the Betsiboka river is ascended, the establishment increases, and the range diminishes. At Marovoai, high water, full and change, is at about 7h. 0m. Springs range $11\frac{3}{4}$ feet, neaps 5 feet. Tidal influence is felt 30 or 40 miles above Marovoai, but during the rainy season it is counteracted by freshets. At the Manana mouth the ebb tide runs 4 knots, and probably more at freshets.

Water.—Water may be easily procured with a hose (200 to 300 feet long), after half tide, at the source between Amboaniho and Bezezika points.

Villages.—Katsépé (inhabited by Sakalava fishermen), Ambotlampi; and, ascending the Betsiboka, Maévarano, Miadana and Marolabo. All of these have but few resources.

The principal place is Marovoai, which has about ten masonry houses belonging to Europeans and Indians. It is a great centre of the production of rice and cattle. The Rova Hova is situated on an eminence of about 150 feet above the town.

THE COAST between Katsépé and Tanjona presents no remarkable p. 212. feature, and shoal water extends off it to a considerable distance. The entrance to Boina or Makambi bay and river is blocked by coral banks, but two channels exist, which, however, are narrow, tortuous, and difficult to follow, as there are no conspicuous landmarks.

Tides.—It is high water, full and change, at Makambi at 4h. 27m.; springs rise 11 feet, neaps $7\frac{3}{4}$ feet.

Makambi island, 236 feet high, is formed by a long narrow p. 213 plateau, bare of vegetation, falling precipitously on each side, but terminating to the north in a somewhat gentle slope and continuing south with several small summits. A small coral reef surrounds it completely. It is uninhabited and offers no resources. The approaches from the north

See charts, Nos. 701 and 378.

and east are clear, and good anchorage and shelter from S.E. winds may be found in 5 to 6 fathoms, mud, with the north-east point bearing S.E. To the N.W. by W. and west, however, a bank with less than $3\frac{1}{4}$ fathoms, sand and coral, extends 6 miles from the north part of the island.

The coast between the river Boina and Tanjona is low, with mangroves intersected by numerous rivers, Andamoti, Maharavi, Marovandi, and Namakia being the principal. The banks uncover for 2 miles outside the mangroves. Good anchorage may be found in $5\frac{1}{2}$ fathoms northward of the river Marovandi. From Ampitsipitsika the land rises gradually to Tanjona.

Provisions.—In the plain south-east of Tanjona, cattle can be procured; also fresh water, at half tide from a little rivulet which descends from the great plateau.

p. 214.

Cape Tanjona is a plateau divided into two parts which from seaward resemble two narrow islands close together, the northern one being the higher of the two. The northern, elevated 351 feet above the sea, is flat; the southern slopes and then falls suddenly. Some smaller eminences appear further to the southward.

Cape Tanjona should not be closely approached as the 5-fathoms contour-line passes $1\frac{1}{2}$ miles from it northward. At $4\frac{1}{2}$ miles E.N.E. from the cape the depth is $3\frac{1}{4}$ fathoms; at $3\frac{3}{4}$ miles W. by N. $\frac{3}{4}$ N., it is $4\frac{1}{2}$ fathoms.

A shoal, composed of coral, with a depth of 5 fathoms on it, lies detached with cape Tanjo bearing S. by W., distant 4 miles; and the northern point of Makambi E. by S.

Thetis bank is a large coral patch 2 miles in breadth, with a head of $2\frac{3}{4}$ fathoms on it, lying $9\frac{3}{4}$ miles N.N.E. from cape Tanjona.

Approximate position, lat. $15^{\circ} 36\frac{3}{4}'$ S., long. $45^{\circ} 42\frac{1}{4}'$ E.

Tanjona pass, the channel between Thetis bank and the coral bank to the eastward, is nearly 3 miles broad, and is one of the best and easiest of the passes. The extreme of cape Tanjona bearing S.W. by S. will lead through its centre.

Barker bank, circular in form and about $2\frac{1}{2}$ miles across, is visible from a distance by the change in the colour of the water, which becomes bright green with large yellow spots, especially in the middle of the day. Its shoalest part of $3\frac{1}{2}$ fathoms is situated $13\frac{1}{2}$ miles W.N.W. from cape Tanjona, but probably there may be less water on this bank.

Approximate position, lat. $15^{\circ} 43'$ S., long. $45^{\circ} 27'$ E.

THE COAST from cape Tanjona to cape Amparafaka, situated 26 miles W. by S. of it, recedes southwards, forming a sort of gulf containing the bays of Maroambitsi (Makambytra) and Boyanna. From cape

Tanjona to Maroambitsi bay, the coast is bordered by coral banks covered with sand, brought by numerous rivers which empty themselves into the bottom of this bay. These banks, over which the depths are very irregular, are steep-to, and no change in the colour of the water distinguishes them; they should therefore be approached with great caution.

Westward of Maroambitsi the coast is low and covered with thick brushwood, but at 2 miles from the sea and near other elevations westward of it stands Boteler hill, 197 feet in height, surmounted by four large trees. Sada point, 136 feet high, on the east side of the entrance to Boyanna bay, may be known by its regular shape and white cliffs.

Between Maroambitsi and Sada point, sand and coral banks extend 2 miles from the shore, outside of which, for a distance of 2 miles, the depth is less than 5 fathoms.

Maroambitsi bay is really only a large estuary where the Boteler and other rivers, bordered by mangroves, empty themselves. It is nearly wholly filled with impassable shoals, and the narrow channel leading to the inner part of the bay, where there is deeper water, is barred by a sandbank upon which the depth is $1\frac{3}{4}$ fathoms.

BOYANNA (Bali) BAY.—Sada point.—The reef eastwards p. 215. of Sada point is composed of several coral banks, of which nearly all the heads uncover at low water; it cannot at all times be distinguished by the colour of the water, and often does not break. Shoal water extends in all directions for 2 miles from Sada point, $2\frac{1}{4}$ fathoms being found at that distance W. by N. from it; a large flat also occupies the east side of the harbour for 2 miles from that shore, which dries almost at its edge, westward of Marotia point.

Cape Amparafaka, the western entrance point, standing 98 feet above the sea, is composed of reddish cliffs surmounted by palms. Hence the coast rises to the southward and is covered with thick brushwood; at 7 miles S. by W. from the cape, there is a somewhat conspicuous round tree upon a hill 218 feet high. Off cape Amparafaka the **Vigilant** bank, with general depths of $3\frac{1}{4}$ to $4\frac{1}{4}$ fathoms, extends $2\frac{3}{4}$ miles to the eastward. Shoal water also continues for about $1\frac{1}{2}$ miles from the western shore of the bay.

At the south-east part of the bay near the village of Soalala, above some red cliffs crowned with trees and almost at the edge, there is a remarkable tree, the top of which, 103 feet above the sea, shows darkly against the background. The bottom, or southern portion, of the bay is greatly obstructed with banks of sand and mud.

Directions.—To enter the bay, bring the tree at the summit of the hill on west side of harbour to bear S. 40° W., and steer for it until the

* See chart, No. 758, and plan of Boyanna bay, No. 708.

north extreme of Sada point bears S. 79° E.; then steer for the remarkable tree north-east of Soalala on the bearing S. 7° E. If entering with the flood tide, guard against being set eastward towards Sada point.

p. 216.

Anchorage may be taken by a large vessel in 7 or 8 fathoms before Marotia point is brought to bear E. by S. $\frac{1}{2}$ S., after passing which line the depth is less than five fathoms. Small vessels may proceed further into the bay and anchor in $3\frac{1}{2}$ fathoms, with the flagstaff at Bali village bearing S. 60° W., and tangent of the near western shore N. 26° W. This will be found a more convenient berth if wishing to communicate with the villages of Bali or Soalala.

Tides.—It is high water, full and change, at Boyanna bay at 4h. 33m.; springs range $10\frac{3}{4}$ feet, neaps $7\frac{1}{4}$ feet. The ebb tide runs 2 knots at springs.

Supplies.—Soalala, Taranta, Marotia, and other villages have a rather considerable trade in cattle with the Comoro islands, and these animals can be purchased at a reasonable price; poultry and eggs may also be obtained. At Bali, where many Arabs live, kids are generally procurable.

p. 217.

Emile bank.—At about 13 miles N. by W. from Amparafaka point there is a coral patch of $5\frac{1}{2}$ fathoms upon this bank.

p. 218.

THE COAST.—**Banks** of coral and sand, which break almost continually, extend one to 3 miles off the coast, from the entrance of Bikaoki river westward across the broad and deep estuaries of Behara, Fola, and Manombo rivers. The coast hence to cape St. Andrew is almost continuously bordered with sand and coral banks, which extend in places nearly to the 5-fathoms contour-line, distant 3 miles from the shore. At $1\frac{1}{2}$ miles N.E. by E. of Kasenji river mouth, a coral patch uncovers 3 feet; at about half a mile off the shore, to the north-west of the same river two coral heads uncover 5 and 7 feet.

Lynx reef uncovers 5 feet at low water. It is not marked by any discolouration of the water, only breaks at intervals, and being relatively steep to and $1\frac{1}{10}$ miles from the shore, should be given a good berth.

p. 219.

Grenouille shoal has not been found, although the bottom was twice seen in the vicinity of the shoal. Nothing less than 12 fathoms was obtained.

See chart, No. 758.

CHAPTER IV.

Cape St. Andrew.—There is a small village with two flagstaffs p. 220. on the low sandy point at the extremity of the cape. There are two clusters of tall trees about 160 yards east of the cape which may be seen 5 or 6 miles on a clear night. The best mark for the cape is a great filao 3 miles to the southward.

The bank extending westward from cape St. Andrew has not been properly examined, and should be avoided. Milanza bank of 3 fathoms, lies 13 miles W.S.W. from the cape.

Flying Fish shoal has been unsuccessfully searched for, but the strong currents, sometimes running N.E., sometimes S.W., made the search difficult. The lead and look-out are the best guides.

Chesterfield island.—The centre of the islet at the east entrance p. 222. of the breakers is ascertained to be situated in lat. $16^{\circ} 19' S.$, and long. $43^{\circ} 58\frac{1}{4}' E.$

Vestal shoal having been fixed relative to Chesterfield island, lies about 4 miles S.E. by E. $\frac{1}{2}$ E. from its previously supposed (and charted) position; possibly, therefore, Vestal and Fernande shoals may be identical.

Dart shoal.—Captain Jourdan of the *Messageries Maritimes* p. 223. reports that this shoal is situated one or $1\frac{1}{2}$ miles west of its assigned position. In heavy weather the sea breaks at a distance of about 100 yards all round, and in the trough, coral heads have been seen protruding: there is therefore much less than 3 fathoms on this danger.

The French Government has given notice of the existence of a shoal, now named **Mpanjaka**, situated N. $3^{\circ} E.$, distant $3\frac{1}{2}$ miles, from Porpoise reef, or approximately in lat. $16^{\circ} 50\frac{3}{4}' S.$, long. $44^{\circ} 7' E.$

Also, that Porpoise reef and Dart breakers appear to be joined by foul ground, forming a bank extending 18 to 20 miles in a north and south direction, on which the water is discoloured, but its edge is not marked by breakers.

JUAN DE NOVA is about 15 feet high, and its west end is covered with trees. Reefs surround the island, and are prolonged for some distance from the east and west points. When anchoring upon the banks northward of the island, the coral patches, which show up dark in

See chart, No. 759a.

calm weather should be avoided. Turtle fishers live here from July to February. Near the centre of the island there are two wells which contain tolerably good fresh water, but not an abundant supply.

Juan de Nova was annexed by the French Government in February 1897.

Tide.—The range of tide at Juan de Nova is at least 10 feet.

p. 226. **Nosi Valavo.**—At 7 miles N.W. by N. from Nosi Valavo, and 5 miles off shore, there is a shoal patch of 3 fathoms. When keeping 10 miles from the coast near this island, the cliffs of Ambatosarotra, white with red portions, which appear to be several miles in length, are very well defined.

p. 228. **Banks.**—About 5 miles W.N.W. of Maintirano is a dangerous sand-bank, steep-to; it breaks, but never uncovers, the yellowish colour of the water coming from the river prevents it from being distinguished.

Three miles N. 30° W. from this there are breakers, and also others reported by the *Mpanjaka* in lat. 18° 4' S., long. 43° 58' E. (approx.).

Nosi Vao (Coffin island).—At 3 miles N.W. by W. from Nosi Vao there is a dangerous reef that only breaks at times.

p. 229. **Flying Fish shoal** and the **breakers** 4 miles south of it should not be approached except in fine weather and daylight, as they have not been thoroughly examined.

p. 230. **North sand.**—The reef about 2 miles to the eastward of this shoal uncovers at low water for about half a mile N. by W. and S. by E. Anchorage in 10 fathoms, mud and sand, was obtained at about half a mile north-eastward of North sand, where there was good protection from a heavy S.W. sea.

Emile Héloise bank.—Upon this bank, at 12 miles N.W. $\frac{1}{4}$ N. from Nosi Mavoni, the depth is probably $3\frac{1}{4}$ fathoms.

Vaudreuil bank is about 4 miles long in an east-north-east and west-south-west direction, and $1\frac{1}{4}$ miles across; it appears to be divided near the middle by a deep-water passage. On one part, at 7 miles N.N.W. $\frac{1}{2}$ W. from Nosi Mavoni, there is a shoal head of $3\frac{1}{4}$ fathoms; on the other, at the same distance N. by W. from the island, the least depth is $3\frac{3}{4}$ fathoms. This bank does not always break.

p. 231. **Bayfield sand** is about $2\frac{1}{2}$ miles long. At its east end is a sand-bank which is always uncovered, and which may be seen about 6 miles. Towards its centre is another sandbank, which uncovers at low water only.

See charts, Nos. 759a and 2461.

NORTH PASS.—Vessels coming from the north and west should pass between the breakers 5 miles south of Flying Fish shoal and North sand on one hand, and the Emile Héloise and Vaudreuil banks and Bayfield sand on the other; the latter is visible about 6 miles, but the Vaudreuil bank must be carefully looked for as it does not always break. The coconut trees when seen off Maintirano, bearing about S. 70° E., would seem to be a good mark to run in on.

BARREN ISLANDS are seven in number. Nosi Mavoni and Nosi Maroantali are to the northward; the southern islands are Nosi Lava, Nosi Andrano, Nosi Manghili, Nosi Dondosi, and Nosi Androta. They are sandy on coral base. Some are wooded, others have only vegetation. They may be seen at the distance of 11 or 12 miles.

Nosi Mavoni (Smyth's island), 21 feet high, is covered with shrubs, but has no trees upon it. A reef runs off to the south-westward for $1\frac{1}{2}$ miles.

Amarella sand is coral and uncovers at half tide. Between it and Nosi Mavoni there is another reef with a sandbank.

Albatross rocks.—The existence of these rocks seems rather doubtful, but it has not been absolutely disproved. They have therefore been retained on the chart.

Mpanjaka bank is nearly 2 miles in extent, with $3\frac{1}{4}$ fathoms on its southern part at $7\frac{1}{2}$ miles W.N.W. from Nosi Mavoni. It probably breaks in bad weather.

Nosi Maroantali (Flinders island) is covered with rather fine p. 232. trees. A reef extends all round it, narrowest on the north side.

Good anchorage may be obtained in 7 fathoms, mud, at about one mile north-east from this island.

Crescent reef and Rontonina reef (the latter covers at high water and is not an island), situated 2 to $3\frac{1}{2}$ miles N.N.E. from Nosi Maroantali, are very steep-to, and should be given a wide berth. Between these reefs and Maintirano there are several reefs which break. The coast here should not be approached nearer than 7 miles.

Boursaint bank.—A partial survey disclosed nothing less than $4\frac{1}{4}$ fathoms, but there is every reason to believe that shallower water exists, so the $3\frac{1}{4}$ fathoms originally reported has been retained.

Nosi Androtra (Beaufort island), 40 feet high at its north end, is narrow and much wooded. It stands upon a reef which extends north-eastward half a mile, and to south-west for $1\frac{1}{2}$ miles from the ends of the island. There is a coral bank extending nearly 2 miles eastward from Nosi Androtra on which $4\frac{1}{2}$ fathoms have been found.

Lockwood reef, on which the sea breaks heavily, is separated from Nosi Androtra by a rather deep and narrow channel. A large and dangerous coral plateau extends for 3 miles to the southward, terminating with a head of $4\frac{3}{4}$ fathoms. It is probable that there are other shoal heads.

SOUTH PASS is between Boursaint bank and Nosi Androtra. This is the best passage for a vessel coming from the southward, as it is the widest and safest, being well marked by breakers on the Androtra and Lockwood reefs. The cocoanut trees of Maintirano when sighted form a good mark to run on.

There are other passages which might be used with great care, but they are not recommended until they are better known.

Nosi Dondosi (Horsburgh island) is covered with shrubs and has no trees. A reef extends off it to the south-westward; there is a narrow impracticable channel between it and Nosi Andrano.

Nosi Andrano (Dalrymple island) and **Nosi Manghili** (Hewett island) are situated on the same reef, which entirely surrounds them and extends for nearly 2 miles in a south-westerly direction. A sandbank, which uncovers at low water, joins them. Nosi Andrano is wooded, and there are a few huts on its north-west part. Nosi Manghili has much fewer trees. There is a channel, with not less than $7\frac{1}{2}$ fathoms, between these islands and Nosi Lava.

Nosi Lava (Heywood island) is the largest of the group. Its north part is rocky and covered with vegetation; there are a few huts on the north-west part. It is surrounded by a reef, except on the north point. There is a channel between it and Simpson sand; the latter is always uncovered.

Purdy sand or South bank is a coral reef, on the north-east part of which is a sandbank which never covers. The sea breaks heavily against it. About 4 miles N. 42° W. of this, 8 fathoms were obtained and the bottom clearly seen. This is probably joined to Purdy sand.

Anchorage.—There are only two anchorages where a certain amount of protection in bad weather can be obtained; the one being between Crescent reef and Nosi Maroantali in 7 fathoms, mud, with right extreme of Nosi Maroantali about S.W. by W., and left extreme Crescent reef N. by W.; the other to the northward of Nosi Lava, in 7 fathoms, sand, with east extreme of Nosi Lava bearing about S. by W. $\frac{1}{4}$ W., and north point of Nosi Andrano bearing about N.W. $\frac{1}{4}$ W. The former anchorage is better than that off Maintirano,

See chart, No. 2461.

which is rather exposed to the swell and current coming between Nosi Lava and Nosi Andrano. Landing is good on these islands.

MAINTIRANO.—This is rather an important place for the export of the produce of Menabé, consisting chiefly of ebony and cattle. The lagoon, with which the river terminates, has three barred entrances, called Kirarondrano pass, Maintirano pass, and Demoké pass. pp. 233, 234.

The village of Maintirano or Kivinja stands on a sandy islet, two-thirds of a mile long. It is distinguished by the Cemetery hill on its north end, and clump of large cocoanuts (the only one along the coast) on the south end.

The Arab village and Viceroy's house and flagstaff are near this clump; the Indian village and Messageries agency are farther to the north. The Sakalava village Sarodrano, stands on the tongue of sand on the south side of the pass, and Ambalahoko village on the islet north of the pass. The entrance to the Maintirano pass is about half a mile westward of Cemetery hill. Local surf boats cross the bar at high water and land on the west side of the islet, or proceed round the south end to the east side. Passing round the north end of the islet is only practicable to pirogues at high water.

Kirarondrano pass is 3 miles to the northward, and Demoké pass 4 miles to the southward. Surf boats enter both these at high water, and proceed behind the trees to Maintirano. The former is perhaps better in bad weather; the latter has the village of Demoké on the north and an Arab construction on the south point of entrance. There are false passes to each, both of which are impracticable. Though ships' boats might use these passes at high water, it is better to employ native boats.

Anchorage with good holding ground may be found in $5\frac{1}{2}$ to 6 fathoms, mud, with the Viceroy's flagstaff bearing east, and the wooded summit S. 18° E.; but vessels of light draught in fine weather may go farther in. The anchorage is exposed to the full force of the westerly winds which sometimes raise a heavy sea; it is then advisable to anchor farther out or proceed to the anchorages of Nosi Lava or Nosi Maroantali.

Trade.—Communication.—See page 6.

Tides.—It is high water, full and change, at 4h. 45m.; springs rise $16\frac{1}{4}$ feet, neaps $11\frac{1}{4}$ feet. The ebb stream attains its greatest velocity, six-tenths of a knot, at half tide, and sets S.W.; the flood at one hour before half tide, runs east, at the rate of four tenths of a knot.

The Coast southward of Demoké river to Ampandikoharana bay has not been examined, and should not be approached; reefs and breakers are known to extend 6 miles from this shore westward of Wooded summit, at 7 miles to the southward of Maintirano. pp. 234, 235.

See chart, No. 2461.

p. 235.

Cape Kimbi is a somewhat prominent point showing as a dark mass, with remarkable white spots, in lat. $18^{\circ} 51' S$. At 6 miles N.W. by W. from it, there is a depth of 4 fathoms in the middle of a bank extending for nearly 5 miles and lying almost parallel to the shore.

Manambolo river.—The entrance, off which shoal water extends some distance, may be recognised by three villages. It enters the sea by two mouths, but Mafaidrano the southern is impracticable even for small boats; Banjavili mouth, situated 5 miles northward, is accessible to boutes. Between the river mouths, near the village of Banjavili, there is a station where the French flag is hoisted, and south of this a conspicuous cluster of cocoanut trees.

p. 236.

SIZIBENGI (Tsijobonina) RIVER.—This river flows into the sea by five principal mouths, called Rafinentana, Ambozaka, Soarana, Tsimanandrafozana, and Namangoa. When approaching the delta from north or south, a conspicuous cluster of cocoanut trees and a red-roofed house will be seen. These are noticeable marks on this part of the coast, which presents a long succession of dark and not very high mangroves. The entrances to the five arms of the river are obstructed by banks which generally break; they shift according to the seasons, and too much trust must not be placed in the natives for guidance in entering.

The Tsimanandrafozana arm, upon which is the large village of that name, with a mean breadth of about 330 yards, is the most important branch. It can be ascended for about 12 miles by following the left bank in a depth of not less than 9 feet. During spring tides the ebb is too strong for a boat to pull against; the water then has a reddish appearance, as far as 7 or 8 miles from the shore. It is impossible for a stranger to recognise the other mouths of the river.

Beacon.—Upon the islet situated westward of the village of Tsimanandrafozana, there is a pyramidal formed beacon, 16 feet in height, the upper part of which is coloured black with a white horizontal band.

p. 237.

OUTLYING SHOALS.—The bank, some 5 miles in extent which lies with its middle part approximately in lat. $19^{\circ} 28' S$., long. $43^{\circ} 58' E$., has probably depths upon it of 5 fathoms. At 13 miles south of this position there is another coral bank with 7 to 18 fathoms on it. These banks have not been examined, and should be avoided, as less water may exist.

D'Estaing shoal has $2\frac{3}{4}$ fathoms least water upon it. About 5 miles west of the shoal there are two heads of $5\frac{1}{2}$ fathoms.

Shoals.—The French Government report the existence of the undermentioned shoals:—

1. A shoal about $2\frac{3}{4}$ cables in extent, and upon which the sea was observed to break.

Approximate position, lat. $19^{\circ} 59' S$., long. $44^{\circ} 6\frac{1}{2}' E$.

See chart, No. 759a.

2. A shoal of about 3 miles in extent in an E.S.E. and W.N.W. direction, with 7 fathoms over it, coral and sand bottom.

Approximate position, lat. $20^{\circ} 1' S.$, long. $44^{\circ} 3\frac{1}{4}' E.$

3. A shoal of about one mile in extent in an E.S.E. and W.N.W. direction, with 5 fathoms over it.

Approximate position, lat. $19^{\circ} 59' S.$, long. $44^{\circ} 0' E.$

Ruby bank has a small coral head 100 yards in diameter of $4\frac{3}{4}$ fathoms, but the bank of shoal water extends a mile to the south-west and 3 miles to the west and north-west.

Cordeliere bank, in about lat. $20^{\circ} 7' S.$, and long. $44^{\circ} 8' E.$, has a depth of $5\frac{1}{2}$ fathoms upon it, and there may be less. Within the 10 fathoms limit it is $1\frac{2}{5}$ miles long and half a mile broad.

Bosi.—The French Government reports the existence of a sandy shoal, with a less depth than 2 fathoms on it, lying 3 miles offshore about 8 miles south-westward of Bosi. Its approximate position, lat. $20^{\circ} 6' S.$, long. $44^{\circ} 21\frac{1}{2}' E.$, may be considered doubtful.

RIVER MORONDAVA.—Miandroka.—This river flows pp. 238–240. through the province of Ménabé, and the produce of the country is conveyed to Nosi Miandroka by native craft. Formerly the main branch of the river was at Ambato, but now the main flow of water passes Miandroka, Ambondro, and Lovobé, of which Miandroka arm is at present the most important. Pirogues can ascend the river for 15 miles. Nosi Miandroka is the chief town, situated on sand and nearly surrounded by mangroves. It is divided into two groups of huts, the eastern group has the Samat establishment, and the French flagstaffs, the western group, the Hova custom house and flagstaff and the British flagstaff; the landing place after crossing the bar is here. The principal pass is between the sand islet and the sandbank, which extends down to Ambondro pass. Pirogues cross the bar at all times, other local craft at high water. Ship's boats can cross the bar in the morning, but should not do so without native guidance. The bar never completely dries, it has about one foot on it at low water. At high water, after passing the bar, boats can proceed round the south end of the sand islet to the Hova custom house; if not near the top of the tide, they must land on the west side of the sand islet.

The village of Ambondro is more or less abandoned, only the Hova custom house agent and a few Indian traders live there. At about $1\frac{1}{2}$ miles south of Ambondro is the Lovobé arm, on the south point of entrance there is a flagstaff and a few huts. Between this and Ambondro the coast is low and wooded, the shore line being studded with huts.

In making land from seaward, Nosi Miandroka may be distinguished from the other places by having more than one flagstaff. The Ambondro

See chart, Nos. 759a, and plan, No. 1036.

cocoanut trees are the best mark for making the land when coming from the southward, their dark colour and superior height render them conspicuous. The mangroves south of Ambondro are an excellent mark for anchorage bearing.

Anchorage may be obtained with good holding in 7 fathoms, mud, with the French flagstaff bearing S. 36° E., and the south point of mangroves of Ambondro S. 7° W. Vessels of light draught can anchor farther in on the same bearing of the French flagstaff. Anchorage off Ambondro may be found with the cocoanut trees bearing about S. 74° E. according to draught, but this anchorage has been abandoned.

Tides.—It is high water, full and change, at Nosi Miandroka at 4h. 36m. ; springs rise $14\frac{1}{4}$ feet, neaps $10\frac{1}{4}$ feet. The direction and velocity of the streams in the offing, which attain their maximum at half tide at springs, is flood E. by N. three-quarters of a knot, ebb West half a knot. At neaps, the stream is too weak to ascertain its direction, but generally speaking the ebb sets to the southward, the flood to the northward.

Trade.—There are a certain number of very thriving industries carried on by white people with native labour. See page 6.

Supplies.—Rice, fruit, and vegetables are plentiful, cattle are numerous.

OUTLYING DANGERS.—A shoal on which the sea breaks has been discovered by the *Boursaint* in about lat. $20^{\circ} 16'$ S., long. $41^{\circ} 9'$ E. This danger lies N.W. by W. $\frac{3}{4}$ W., $8\frac{1}{2}$ miles from Nosi Miandroka, and directly in the approach to that place.

Macé shoal.—The French Government report that this shoal lies about $2\frac{1}{4}$ miles west of its present charted position, with point Anara bearing S. 3° W., and the cocoanut trees of Ambondro bearing N. 86° E. ; it has $1\frac{3}{4}$ fathoms on it, but until further information is received, Macé shoal has been retained on the chart in its original position.

The shoal of $4\frac{1}{2}$ fathoms N.W. of Anara (cape Ankarara) has been unsuccessfully searched for.

p. 241.

THE COAST.—South of Ankeva are two rather prominent points, the southern of the two being the more remarkable ; they are both marked by white patches amongst the wood which covers them. The downs terminate at the Taolampia opening with a low but well-defined hill which has a white patch and tuft on its summit.

BELO.—The village stands on a long and narrow sandy point, at the extremity of which is the Hova flagstaff and custom house. About three-quarters of a mile S.W. by S. from this flagstaff is a large filao

See plan, No. 1036, and chart, No. 759a.

which is the best mark for making the land, it is seen long before the flagstaff. Three-quarters of a mile south-west of the Ambaratrata river is a clump of filao trees. The river is obstructed by numerous banks. A sandbank, which is very steep-to, projects about one mile to seaward off Belo. Between this bank and another to the eastward, which uncovers 11 feet at springs, is the channel for entering. The banks are subject to change.

Anchorage will be found with the remarkable filao, bearing S. 2° E. p. 242. and the clump of filaos being S. 54° E. in 7 fathoms, sand and mud, good holding ground. A vessel will thus be $1\frac{1}{2}$ miles from the village and boats can cross the sandbank at high water.

Tides.—It is high water, full and change, at 5h. 37m.; springs rise 14 feet, neaps $9\frac{3}{4}$ feet. The flood stream attains its maximum at one hour before high water, and runs E. by N. three-quarters of a knot; the ebb at half tide, sets N.N.W. a quarter of a knot.

Too much care cannot be taken in approaching Belo as the ground is only partially examined and many undiscovered dangers may exist, the lead and look-out are the best guides. Rivers discharging into the sea cause the discolouration of the water, which the banks and shoals do not.

DETACHED SHOALS AND ISLETS.—**Sandy knoll** is a large coral reef breaking violently, more than 3 miles long N.E. by N. and S.W. by S.; it has two sandbanks uncovering at low water at either end, that on the north-east end being the highest.

Bawden shoal has only $1\frac{1}{2}$ fathoms on it, and extends for nearly 3 miles in a south-westerly direction. The passage between this shoal and the coast may be considered safe.

Barlow island (Nosi Andriangori) is $3\frac{3}{4}$ cables long by $2\frac{3}{4}$ broad, north-west and south-east; low, covered with stunted vegetation and a few filaos. A reef, which is very steep-to, extends six-tenths of a mile off its north-west point.

Sand island reef is about $4\frac{1}{2}$ miles, N. 60° E. from Barlow island. The sandbank on its east extremity uncovers about 3 feet, and is steep-to all round except to the south-west, where 2 fathoms will be found at one mile distant.

Osprey shoal is only one out of many shoal heads on a large bank p. 243. which extends off the coast. Up to the present, $1\frac{1}{2}$ fathoms is the least water found; it is dangerous from the water over it not being discoloured. The coast in this vicinity should not be approached within 4 miles.

Boursaint bank is rather more than 2 miles to the westward of the south point of entrance to Lampaolona river and may be assumed to be connected with the coast. On its east part are three heads with less than 6 feet, that to the north-east having only one foot at low water springs. From this head Barlow island bears N. 15° W., south point Lampaolona river entrance, S. 78° E., Sandy knoll (Nosi Bé), N. 51° W. It does not show by discolouration and is steep-to on its western side.

A reef is situated N. 50° E. $4\frac{8}{10}$ miles from Nosi Andrianmitarika, which is scarcely visible at high water, but on its north-east end a sandbank uncovers at low tide. In passing between this reef and the island, pass nearer the island than the reef.

NOSI ANDRIANMITARIKA (Crab island) is about 800 yards long by 400 yards broad, and about 16 feet in height. As seen from east or west, there are two groups of filaos upon it, the northern group being the larger; also a few tamarind trees, the largest of which shows as a pyramid and has been taken for a rock. This island is one of the best points for making the land about Ampasilava bay, and is surrounded by a coral reef which projects upwards of half a mile on the north and west, but $1\frac{9}{10}$ miles to the southward.

Anchorage.—Anchorage is to be found in 9 fathoms, mud, three-quarters of a mile from the east coast; it is protected from south and south-west winds by the reefs, and foul ground extending $2\frac{1}{4}$ miles south-east and south from Nosi Andrianmitarika.

Tides.—It is high water, full and change, at Nosi Andrianmitarika at 5h. 40m.; springs rise 14 feet, neaps $12\frac{1}{2}$ feet. The flood runs half a knot an hour to the south-eastward; ebb, half a knot to the westward.

p. 244-5.

AMPASILAVA BAY has good holding ground, but the anchorage is a long way off shore and exposed to north and west winds. On the east side of the bay there are vegetated ridges or downs which terminate at a small river $1\frac{3}{4}$ miles north-eastward of the village, the coast then becomes low and wooded with sandy fore-shore. The Hova station with flagstaff is palisaded, the houses of a French firm are north-east of it, the Sakalava villages are further in the interior; these together with a large tamarind tree will be seen on approaching the anchorage. A mile westward of the village is the mouth of a river, which with the other streams in the neighbourhood probably form the delta of the Mangoka.

Several sandbanks lie off the village, one of which extends $1\frac{1}{2}$ miles seaward of the village; this bank, which never uncovers, extends as a

See charts, Nos. 759a and 2464.

tongue from the small river east of the village. Another lies about half a mile westward of this and only covers at springs. Between these two is the boat passage with about one foot at low water. At the west extremity of the last-named bank is West islet, which is remarkable from having two trees. East islet has a few huts on it, and is nearer the coast. At ebb tide the muddy water of the rivers extends seaward for some distance and looks like a bank.

Position.—Ampasilava (Ranopasé) village is in latitude $21^{\circ} 18' S.$, and longitude $43^{\circ} 45' E.$

Anchorage.—Bring the Hova flagstaff to bear $S. 6^{\circ} E.$ and run in on that bearing until the double tree on West islet bears $S. 51^{\circ} W.$, 5 fathoms, mud, will then be obtained. This position however will be inside a depth of $4\frac{1}{2}$ fathoms half a mile seaward. Vessels of light draught can proceed on the same bearing of the flagstaff farther in, and the same bearing will take boats through the passage to the village. There is a $3\frac{1}{4}$ -fathoms patch, and also one of $4\frac{1}{2}$ fathoms, in the anchorage ground which should be avoided. In strong westerly winds it is better to anchor farther out or proceed to the anchorage at Nosi Andrianmitarika.

Tides.—It is high water, full and change, at 5h. 0m.; springs rise $14\frac{1}{4}$ feet, neaps $9\frac{1}{4}$ feet; flood sets about E. by S. three-quarters of a knot an hour, ebb N.N.W. half a knot.

RIVER MANGOKA.—This river discharges by several branches p. 245. forming a delta which changes with the seasons, as also do the sandbanks which extend for 2 miles off the different mouths. The coast is flat and monotonous, and bordered by mangroves. The bar sands dry, and the channels are shallow, sinuous and difficult, and cannot safely be used by a stranger.

Landmark.—At Ambolihé village, 15 miles W. $\frac{1}{2}$ N. from Ampasilava village, and close to one of the outlets of Mangoka river, a Norwegian Chapel has been built, the zinc roof of which showing over the green of the mangrove trees, forms a good mark for this part of the coast.

TSINGILOFILO BAY extends from Andefitra point to cape Tsingilofilo the northern extreme of Bevato island. On the east it is bounded by the mainland, on the west by reefs and islets.

Point Andefitra is the south point of the mouth of the river Antseranandefitra, which is an arm of the Mangoka. There is a coral point about $2\frac{1}{2}$ miles south of this, and then cape Morombé. Behind is a ridge of hills about 230 feet high, gradually sloping down to cape Morombé, near which the land is low and wooded. Morombé village is situated here; it has no resources.

Cape Morombé is a steep sandhill 13 feet high, which looks like a cliff from seaward; it is bordered by a sand and coral reef, very steep-to. Between it and cape Tsingilofilo the coast is covered with mangroves, indicating the mouth of a large river.

247. **Nosi Andramona** is a small island 27 feet high lying 3 miles W. by N. $\frac{1}{2}$ N. from Andefitra point, and standing at the south-west end of a reef $1\frac{3}{4}$ miles in extent, between which and the above point there is a boat passage, only available at high water. Shal water over a coral bottom extends for one mile to the south-west of Nosi Andramona.

Nosindolo is a group of two islets which are about 6 feet high and rocky, and a sandbank which covers only at springs. They are easily recognised by their whitish appearance.

Nosi Bé is the name given to the reef between Nosi Trozona and Nosindolo; it has a rock at its north-east extreme which only occasionally covers at springs, and one at its south-west edge which uncovers 7 feet at low water.

Nosi Trozona is of diamond shape, the sides being about half a mile long; it rises to a hill in the centre 43 feet in height.

248. **Nosi Timpoi** is pretty high with a few trees.

Nosi Ratafani 59 feet high is a long narrow island, rocky and wooded. South-eastward of it stands **Ratafani islet**, 125 feet high, conical and wooded; from seaward it may be mistaken for the summit of Nosi Ratafani.

Directions.—There are narrow deep-water channels on either side of Nosi Bé reef leading into Tsingilofilo bay, but neither are suitable for vessels, being narrow and intricate. The ship passage lies between Nosi Andramona and Nosindolo. After passing between these small islets and their surrounding reefs, steer with cape Morombé bearing S. 23° W., which will lead to the anchorage.

Anchorage.—There are two, the Village and Cape anchorages. The Village anchorage is about three quarters of a mile north-west of Morombé village, with north point of Nosi Trozona bearing N. 69° W. and cape Morombé S. 24° W., in $4\frac{3}{4}$ fathoms, mud, good holding ground and well protected, but it is very confined. The Cape anchorage seems to be the best, and is southward of a line joining Trozona and cape Morombé. The bottom is mud and good holding ground. In going from Village to Cape anchorage, it is stated that Andefitra point should be kept on a N. 60° E. bearing, but as this leads over a 3-fathoms bank care and judgment must be exercised.

Tides.—It is high water, full and change, at 6 hours; springs rise $12\frac{1}{2}$ feet, neaps $8\frac{1}{2}$ feet. The streams in the passes turn at high and low water.

CAPE ITSERI will be recognised by two rocky islets, and p. 249. especially by an isolated pointed hill 39 feet high, nearly a mile south of which is another hill equally noticeable. These hills are good landmarks. The coast further south presents nothing very remarkable, but the off-lying islands, Nosi Bemoka and Andamotibé, are easily recognised.

Parsons reef has a sand bank on its east side which uncovers at low water. The passage between it and the reef off Nosi Andrahombava is not safe, having coral patches of 5 fathoms in it, which would probably break in bad weather.

NOSI HAO is very low (13 feet), one mile long by 2 cables broad, covered with scrub, but has no filaos, which distinguishes it from Nosi Andrahombava. Nosi Hao also appears from the westward the larger of the two. Landing would seem to be effected most easily on the north-east side.

Tides.—It is high water, full and change, at Nosi Hao at 5 hours; springs rise $8\frac{1}{2}$ feet, neaps, $5\frac{1}{2}$ feet. The flood sets about N. by W. a quarter of a knot, ebb to the southward half a knot an hour.

NOSI FASI is about one mile N.N.E. of Nosi Hao; on its east edge is a sandbank which uncovers at half tide. There is a passage of nearly 4 cables between it and Nosi Hao, but there is a patch of $3\frac{3}{4}$ fathoms in the channel; it has not been thoroughly examined, and must therefore be considered unsafe.

The COAST.—Two miles E. $\frac{1}{2}$ S. from the north point of Nosi Hao, before point Andavaloaka, is a large black perforated rock; behind this rock is a shallow sandy creek, at the head of which stands the village of Andavaloaka. Antseranambe point is rocky, and south of it is a sandy shore, bordered by downs covered with filaos, then comes the village of Ampasilavadambao; from here to the north point of Fanemotra bay the coast becomes rocky with wooded hills in the background.

Vessels may pass between the coast and these islands and reefs for anchorage at Nosi Hao or Nosi Andrahombava by keeping about midway between the coast and the reefs, but the entrance should be effected either south of the reef off Nosi Hao or that north of Nosi Andrahombava; the other passages being only partially examined are not recommended.

See chart, No. 2464.

- p. 250. **MPANJAKA ROCK.**—M. Jourdan, in command of the *Mpanjaka*, discovered a rock in appearance like a whale's back, situated N. 62° W., $2\frac{7}{10}$ miles from Lamboharana point.

FANEMOTRA BAY.—Lamboharana point at the north end of the bay is of moderate height; near its south extremity there is a small peak, 61 feet high, which is remarkable. This point is in reality part of an island which is separated from the mainland by a channel for boats, on the banks of which is the village of Lamboharana.

Vatomandefoka reef.—At $2\frac{1}{2}$ miles W. $\frac{1}{2}$ S. from Lamboharana point lies the end of an extensive reef which projects N.N.W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles from Mananonoka point on the south-west side of the bay.

The south and south-west winds are often fresh and raise a high sea. Northerly winds bring a moist heat and fine weather. The land breeze rarely blows strong. There are occasional westerly gales.

- p. 251. From Fanemotra bay to Mamirano bay the shore consists of jagged and singular-shaped bare hills, with rocky coast line.

- p. 252. **MANOMBO or MAHANOMBI**, standing at the mouth of the river of the same name, consists of three villages, the principal one being situated on the right bank at the river's mouth, in an elevated position, the other two villages are situated north and south of this—the latter consisting of a few huts only. At half a mile northward of the river mouth and near the coast stands the Norwegian mission house with pointed metallic roof. The Ambohife hill which dominates the village, and upon which is the Rova where the French flag is hoisted, also serves as a good landmark.

The mouth of the river is not well defined, and has no great depth at its mouth, which dries almost completely at low water, and has no channel even for boats; the natives ford it on foot at nearly all times of tide. Opposite the mouth is a passage for boats, inside which landing may be effected on any part of the coast.

Anchorage.—There is anchorage in the bay, with fairly good holding ground, but it can only be used in fine weather. The *Surprise* anchored with Norwegian mission house bearing N. 21° E., and custom house S. 62° E. in 4 to 5 fathoms, sand.

PORT RANOBÉ, one of the best anchorages on the coast, is a reef-bound basin, 7 miles long by 4 miles broad; the place has no commercial importance. On the north is Toni point, near which is a conspicuous hill with sharp steps or ridges seen above the trees. From Toni point, mangroves fringe the coast for 4 miles to the southward.

Then come a series of wooded nipples, with a coast of rocky points and sandy bays beneath them. On the south side of the basin is a square shaped hill with a few filaos on its summit; it is useful for bearings.

There are several coral banks, uncovering about 3 feet at low water, in the basin, but they are easily seen by discoloured water at high tide.

The Fanandomotra pass, which has a navigable breadth of nearly 400 yards, cannot be recommended, except in fine weather, on account of the violent currents and the sea, which in bad weather prevents the line of breakers being distinguished—this is the more important as the pass must be entered and navigated by the eye and lead. The depths will be found changing rapidly from 13, 7, $4\frac{1}{2}$, and $5\frac{1}{2}$ fathoms. It is best to enter the port an hour before low water, and to leave at high water. After passing through, good anchorage appears to be obtainable in $5\frac{1}{2}$ fathoms, sand, with Toni hill bearing about N. $\frac{1}{4}$ W.

Tides.—It is high water, full and change, at Port Ranobé at 6h. Cm.; springs range 9 feet. The currents, though very violent in the pass, are feeble in the bay, not exceeding three-quarters of a knot. The flood and ebb streams are greatest at half tide, the former setting to the northward, the latter to the southward.

The COAST to the southward is sandy, rising to low bare hills, p. 253. and with very little vegetation; it is bordered by a reef, which may be approached to a distance of half a mile. The delta of the Fiherenana consists of a large sandy islet to the east, and mangroves to the west. On the islet are two small hills, on which stands the village of Anosi. Three-quarters of a mile north-westward is Anosi point. This point is low and extends some distance under water, as shown by discolouration; when entering the northern passage, vessels should keep nearer the reef on this account. The river Fiherenana may be recognised by a gap in the hills at the back. The coast between Tulléar and Mahavatra point consists of sand hills, which are remarkable; between Mahavatra point and Kilibé point the shore is lined with mangroves. Landing at half tide may be effected on a sandy beach on the south side of a stream, near the fishery, north of Befotaka point. From Kilibé point, southward, the coast is low and wooded.

TULLÉAR CHANNEL.—(The northern passage).— p. 253.

The safe part of this passage is about 500 yards broad. To enter, bring Mainia hill to bear S. 50° E., and steer on that bearing until the low point about 2 miles north of Anosi point bears N. 22° E., when the ship will be 4 cables from the north point of the great reef, and in the middle of the channel, and can steer S. 28° E., the fairway course for the next

See chart, No. 760, and plan, No. 692.

4 miles. If intending to anchor in Tulléar bay, continue the latter course for about $1\frac{1}{2}$ miles and steer for Mainia hill when it bears S. 54° E., which will lead to the anchorage. The entrance is not easy to make out from a distance, especially in bad weather; if in doubt, it is better to make the reef a little to the southward of the entrance, and steer along its edge until the north end is reached, which can then be rounded into the passage. By making the passage too far northward it is stated that the entrance to the small bay immediately north of Anosi point may be mistaken for the entrance to Tulléar channel.

Anchorage may be had in $4\frac{1}{2}$ fathoms, sand and mud, good holding, with Table hill bearing S. 51° E., and the conspicuous roof (Jaquelin) N. 66° E. This anchorage is secure the whole year round, but wind and tide sometimes make a nasty sea for boats; at low tide they ground a good way from the land. Avoid anchoring further south on account of the $2\frac{1}{2}$ -fathoms shoal.

In proceeding southward between the great reef and the mainland, although a general track is indicated, the lead and careful look-out must be chiefly relied on. When the tide begins to rise is the best time to navigate, having due regard to the position of the sun.

p 257. **South or Sarondrano pass** has a clear width of 7 cables. To enter, steer for Table hill on a N. 57° E. bearing.

Sarondrano point.—The extremity is marked by a remarkable tree with two heads. A boat will always find sufficient water at half tide to land at the village through a break in the reef.

Tides.—At Tulléar it is high water at full and change at 5h. 53m.; springs rise $8\frac{1}{2}$ feet, neaps rise $4\frac{1}{2}$ feet. The greatest velocity of the flood at springs (an hour before high water) is about $1\frac{1}{4}$ knots, that of the ebb (an hour before low water) being rather less.

Near the south pass, the flood sets N. by E. $\frac{1}{2}$ E., and the ebb S.W. by S., both at a maximum velocity of three-quarters of a knot.

The tidal wave does not pass right through between the great reef and the mainland—the tides in that channel are therefore irregular.

p. 258. **Barn hill or Talio Koaka.**—The white chalky cliffs of Barn hill, when lighted by the sun, are seen at a great distance. The little bay between Barn hill and Tambohabo is shallow and exposed to the sea; it is, together with the plateau running off it, unsuitable for anchorage.

River Onilahé.—Cliffs form the south bank of this river. The south point of the entrance is sandy, backed by cliffs. On the sand stands the village of Ampasimanoro. The cliffs extend south-westward

See plan of St. Augustine and Tulléar bays, No. 692.

to the valley of Lovocampi, and are rather higher than those westward of that place; being white, they show up well with the sun shining on them. The valley of Lovocampi makes a break in the cliffs of about 600 yards, which is filled by a sandy beach, at the north end of which is the Lovocampi village. The valley is cultivated, and contains numerous fresh water pools in which there are many alligators. At the west point of this break is a large rock separated from the cliffs. The cliffs extend westward as far as Tent rock. From Tent rock a line of hills, covered with impenetrable scrub, runs to the southward into the interior, and the coast, as far as Anakao, is flat and sandy with a curtain of trees in the background.

Saolara village is about 700 to 800 yards in length, and has a p. 259. large hut at its east end. Behind the village is a well of indifferent water.

Anchorage should be made at a greater or less distance from the land according to the season. From April till October a vessel may anchor near the land with Ampasimanoro bearing N. 86° E., and Tent rock S. 24° E., in about 9 fathoms, stiff black mud, good holding; but at other times farther out in 15 or 16 fathoms, mud. The swell causes vessels to roll when broadside on. After September a sailing vessel should not anchor off Saolara, but find shelter at Sarondrano.

Tides.—It is high water, full and change, at St. Augustine bay at 5h. 50m.; springs rise 10½ feet, neaps 7¼ feet.

Landing.—The reefs protect the shore, and boats can land with ease. The west end of the village can be approached at all hours of tide through a large opening in the reef. The landing at low water in front of Tent rock is impeded by shoals.

The reef between Saolara and Nosi Vei extends about half a mile from the coast; pirogues navigate inside it at all times of tide. The two small rocks mentioned in the directions do not exist. The outer edge of the reef is tolerably steep-to, but the bank of 6½ fathoms off its north-west edge should be avoided, as it breaks in bad weather. The flood sets to the eastward and the ebb to the westward in this locality.

Anakao point is low and rocky, but well defined. At about one mile distant stands the village, to which a break in the reef allows access by boats. There is a second village behind Anakao, where there are large herds of cattle. The natives have not a good reputation.

Winds.—When the sea breeze is from the southward, it blows p. 260. strong, and for three days together without any land breeze. A red sunset, cloudy sky, misty pale sun in the morning, are indications of

this strong breeze. A grey horizon seaward generally precedes a strong sea breeze. The barometer does not foretell the approach of northerly or southerly winds, as it falls or rises respectively with these winds, but in strong south winds it usually stands higher than 30·16 inches. During six weeks from the 1st of September, the readings ranged between 30·25 inches and 29·88 inches. With a relatively low barometer and moisture in the afternoon, a N.W. wind will probably blow the next day. With southerly winds the temperature is fresh and dry. The weather begins to break up and becomes unsettled in the first week of October. North-west gales of moderate strength, and lasting for two or three days, appear to commence in November. Cyclones seem to be unknown to the natives.

p. 261. **Nosi Vei.**—The four large houses with their flagstuffs are the most conspicuous objects on this island, and are seen in the offing before the island itself. The transit of Venus pillar at the south-east corner is conspicuous from the anchorage. There is a small landing stage before the Hermann house. A bank of sand and coral extends off the north-east point of the reef for $1\frac{1}{2}$ miles, on which the least water found is $4\frac{3}{4}$ fathoms, which breaks in bad weather or when the tide sets against the wind. Sandbanks seem to be extending to the north-westward, but the west coast is washing away. Anchorage should be taken in about 5 fathoms, sand and coral, eastward of the island, but the holding ground is not good, and strong currents and changes of the wind often foul the anchor and cause the ship to drift. When the sea washes the foot of the landing stage, landing is easy anywhere; if it does not, boats should run for the shore with the roof of the Jaquelin house and flagstaff behind in line.

Tides.—It is high water, full and change, at 5h. 50m.; springs rise $10\frac{1}{2}$ feet, neaps $7\frac{1}{2}$ feet. The stream attains its maximum velocity of one knot at half tide, the flood running N. by W., ebb S. by E.

p. 263. **Port Masikoro.—Directions.**—Until further information respecting this anchorage is obtained, it should be entered with great caution, and no reliance placed upon the directions which are at variance with the present chart.

p. 265. **Europa island** is about 40 feet above sea level, and the trees upon it are of moderate height. Fresh water is entirely wanting; the fishermen at the island are obliged to distil sea water.

Europa island was annexed by the French Government in February 1897.

See plan, No. 692, and charts, Nos. 760 and 851.

CHAPTER V.

RÉUNION.—Pic Cimandef.—At line 9, *for* “southward” p. 270.
read “northward.”

Bel-air lighthouse has two red bands at its upper part. The p. 274.
light is exhibited from a height of 151 feet above high water.

St. Paul bay.—The red light at the landing-place, shown from an p. 278.
elevation of 23 feet above high water, is of small power.

Pointe des Galets port.—*See* page 73. p. 279.

Shipping.—There were 164 vessels entered at the several ports of p. 282.
Réunion in 1896, with an aggregate tonnage of 130,298; of these vessels,
46 carrying 47,567 tons were British.

Imports and Exports.—The imports to Réunion in 1895 were
valued at 746,007*l.*, the exports from the island at 869,381*l.*

MAURITIUS.—At line 1, *erase* “St. Paul, Amsterdam,” these p. 285.
islands being French possessions.

Nab reef.—At line 27, *for* “centre” *read* “west end.” p. 287.

Abbé bank.—At line 15, *for* “13 to 88” *read* “11 to 19.” p. 288.

A rock.—At line 37, *for* “N. by W. $\frac{1}{4}$ from” *read* “N. by W. $\frac{1}{4}$ W. p. 292.
from.”

Port Louis.—At line 24, *for* “2,670” *read* “2,676”; and at line p. 293.
28, *for* “1,080” *read* “1,061.”

Cyclones.—On April 29th, 1892, a most severe cyclone visited p. 296.
Mauritius, in which many lives were lost, and much property destroyed
and damaged. The peculiarities were that it occurred on a much later
date than before known, and was preceded by a great deal of thunder and
lightning, which is unusual. Many sun spots were also observed. It
commenced with the wind at N.E., instead of S.E., as usual. The
barometer fell to 27·956 inches, which is the lowest reading recorded at
Mauritius. The maximum velocity of the wind was 121 miles an hour.
The centre passed from about W.N.W. to E.S.E. over the island, which
can only be accounted for either by the main storm having recurved, or
that a smaller cyclone was formed in the south-east quadrant of the main
storm, and travelled to the E.S.E.

In February 1896, the island was visited by a cyclone lasting three days,
which was more remarkable by the heavy rain that accompanied it than by
the force of the wind. On the 20th, when the wind was at its greatest
velocity of 51·3 miles an hour, rain to the extent of 17·34 inches (one-
fourth of the total amount for the whole year) fell in 24 hours, causing
great damage to roads, bridges and property.

Royal Alfred Observatory.—At line 22, *for* “longitude p. 297.
3° 50' 12·6" E.” *read* “longitude 57° 33' 6" E.” At line 25, *for* “2,870”
read “2,676.”

See charts, Nos. 1497 and 711.

pp. 298-
300.

Weather.—

TABLE showing the Results of Observations made at the ROYAL ALFRED OBSERVATORY, MAURITIUS.

Month.	Barometer.										Temperature of the Air. (Mean.)		Rainfall.*		Wind 1876 to 1894.		
	1894.					1875 to 1894.					1894.	1875-94 (Mean).	1894.	Inches.	Directions (Mean).	Miles.	Year.
	Maxi- mum.	Day of Month.	Mini- mum.	Day of Month.	Maxi- mum.	Day of Month.	Year.	Mini- mum.	Day of Month.	Year.							
January -	Inches. 30·049	19	Inches. 29·412	14	Inches. 30·169	30	1881	Inches. 29·330	22	1893	77·7	78·2	14·58	7·51	S. 88 E.	49·8	21 1881
February -	30·031	5	29·276	22	30·170	23	1881	29·064	10	1877	77·8	78·2	4·48	6·21	S. 81 E.	77·5	19 1876
March -	30·136	31	29·739	13	30·193	14	1888	29·032	21	1879	77·0	77·4	3·99	7·96	S. 78 E.	80·3	21 1879
April -	30·122	25 & 26	29·777	22	30·258	14	1888	27·956	29	1892	75·1	76·0	6·11	5·96	S. 72 E.	103·3	29 1892
May -	30·249	12	29·913	5	30·305	17	1877	29·841	2	1877	71·3	72·6	4·41	4·03	S. 65 E.	32·4	17 1878
June -	30·322	30	29·978	2	30·468	20	1877	29·892	29	1878	67·7	69·8	0·76	2·00	S. 61 E.	41·5	30 1881
July -	30·340	1	30·005	9	30·453	8	1880	29·945	5	1878	69·3	68·6	2·29	2·38	S. 65 E.	34·3	12 1877
August -	30·342	13	30·064	20	30·426	21	1891	29·881	10	1882	69·0	68·6	2·09	2·16	S. 68 E.	34·4	11 1879
September -	30·302	1	30·044	10	30·387	21	1878	29·902	5	1878	69·6	69·6	1·88	1·46	S. 71 E.	35·4	6 1878
October -	30·224	2	29·942	12	30·340	7	1877	29·911	27	1885	71·4	71·5	1·11	1·73	S. 78 E.	33·2	13 1880
November -	30·251	11	29·784	30	30·301	8	1886	29·784	30	1894	74·4	74·4	1·41	1·90	S. 82 E.	34·0	12 1891
December -	30·053	14	29·730	19	30·210	7	1876	29·550	19	1879	77·7	77·1	5·90	5·11	East.	44·9	7 1883

The highest pressure in the period 1875-94 was 30·468 inches on 20th June 1877 ; and the lowest 27·956 inches on 29th April 1892. Reduced to sea level.
In 1894, there were 196 days of rainfall ; or nine below the average. The greatest fall in one day was 3·70 inches on 11th January.

* On 20th February 1896, during a cyclone, 17·34 inches of rain fell in 24 hours. See page 55.

Water.—At Port Louis the water is of indifferent quality; it should p. 303. be boiled and filtered for drinking purposes.

Shipping.—The number of vessels of all nationalities which entered the ports of Mauritius during the year 1896 was 391, of 394,371 aggregate tonnage.

Exports for the year 1896 from Mauritius, amounted in value to 29,061,141 rupees.

Imports for the year 1896 amounted to 22,501,462 rupees.

Docks.—Stevenson dock is 377 feet in length on the blocks. In 1896 p. 304. a vessel of 3,781 tons, 384 feet in length, 45 feet beam, and drawing 17 feet, was docked without difficulty.

Repairs.—Large repairs to the hull, engines and boilers of vessels p. 305. can be executed at Port Louis. Ten tons of iron can be melted and run at one time. There are three cranes that will lift 25 tons; depth alongside the Port jetty, 13 feet at low water.

Population.—The total number of inhabitants in Mauritius on p. 306. 31st December 1896 was estimated to be 375,955, of which the general population numbered 60,120 males and 56,077 females; whilst the resident Indian population was 146,721 males and 113,037 females.

Telegraph.—Mauritius is in telegraphic communication by sub- p. 307. marine cable with Zanzibar, via Mahé, Seychelles islands, and hence with all parts of the world. At line 8, for "92 miles" read "105 miles."

Coast.—At line 7, for "on" read "no."

p. 308.

Black river bay.—There are two Martello towers at Black river bay, one on the northern point of entrance, and the other on the south entrance point.

Grand Port.—Buoys.—The following buoys mark the south p. 311. entrance to Grand Port :—

- a. A can buoy painted black, off the 3-fathoms spit lying 3 cables N.N.W. from point de la Passe.
- b. A can buoy painted black, close northward of Olive bank.
- c. A can buoy painted red off Horseshoe point.

Beacons.—The under-mentioned beacons are (September 1897) in position :—Sappho, Petit Pâté, Grand Pâté, and Buffn reefs; also the East and West Le Matcassé.

See plan of Grand Port, Mauritius, No. 1401.

As these beacons are simply small iron tubes without distinguishing marks, and show only about 3 feet above high water, they are of little guide to a vessel approaching an anchorage.

The buoys and beacons cannot be depended upon.

p. 314. **Amber island.**—At line 15, for “nigh” read “moderately high.”

pp. 317, 318. **RODRIGUEZ.—Mathurin bay.**—The buoy marking the inner end of eastern passage is moored on the south-west extreme of the two-fathoms patch. There is only one flagstaff, that formerly called the eastern.

p. 318. At line 9, for “for N.E. by E.” read “N.W. by W.”

Tides.—At line 29, for “springs rise $5\frac{1}{2}$ feet, neaps $1\frac{1}{2}$,” read “springs rise 5 feet, neaps rise $3\frac{1}{2}$ feet.”

p. 319. **Population.**—The population of the island in December 1896 was 2,635, who are traders, agriculturists, and fishermen.

Shipping.—Eleven vessels arrived at, and left Rodriguez, during 1896.

p. 320. **Exports** in 1896, amounted to 103,181 rupees; the **imports** to 154,886 rupees.

p. 321. **SAYA DE MALHA BANK.—Poydenot shoal.**—The French Government has given notice that M. Poydenot, Commander of the Messageries Maritimes steam vessel *Armand Béhic*, reports, that having seen the bottom on the northern edge of Saya de Malha bank, soundings of $4\frac{3}{4}$, 6, and $6\frac{1}{2}$ fathoms were obtained in about lat. $9^{\circ} 45' S.$, long. $61^{\circ} 25' E.$

Shoal ground.—Depths of 4 fathoms have been reported to exist on the southern portion of the bank in the neighbourhood of lat. $10^{\circ} 50' S.$, long. $62^{\circ} 0' E.$; and on the northern portion in the vicinity of lat. $8^{\circ} 45' S.$, long. $60^{\circ} 12' E.$

p. 322. **AGALEGA ISLANDS.**—H.M.S. *Lapwing*, in August, 1892, found the buoys still in position. There was a wreck northward of the pier, that had been driven on shore from the anchorage in October 1891.

There was said to be anchorage in 15 fathoms N.W. of North island, but at $1\frac{1}{2}$ cables from the shore no bottom at 45 fathoms was obtained. Landing at this part of the island is practicable.

When lying off the settlement, a strong northerly set was experienced.

p. 324. **NAZARETH BANK.**—This bank, within the imperfectly defined 100-fathoms contour-line, may be considered to extend from the Cargados Carajos reefs in a N.E. by N. direction for 200 miles, terminating in about lat. $13^{\circ} 20' S.$, long. $61^{\circ} 10' E.$; the breadth varies from 30 miles

to nearly 100 miles. The least known depth, of 14 fathoms, is near the east extreme in lat. $14^{\circ} 80' S.$, long. $61^{\circ} 28' E.$; at about 50 miles, W. $\frac{1}{4}$ S. from this place the depth is 15 fathoms, and no soundings upwards of 20 fathoms have been obtained between these two positions.

Cargados Carajos.—At line 13, *for* “meridians $69^{\circ} 30'$ ” *read* p. 325. “meridian $59^{\circ} 30'$ ”; and at line 22, *for* “south east part” *read* “north-east part.”

Supplies.—At line 15, *for* “form” *read* “from.”

p. 327.

CHAPTER VI.

SEYCHELLES BANK.—A recent examination (1892) of the p. 329. western edge of the Seychelles bank shows that a nearly continuous rim, of more or less shallow water, extends from Bird island to beyond the western limit of the bank.

As it is evident that dangerously shoal spots may exist in many parts of this rim, besides those already known, ships should avoid crossing it north of the parallel of lat. $5^{\circ} S.$ Southward of this parallel there is, according to the scanty information existing, apparently a break in the rim.

Andromache shoal.—At 8 miles E.N.E. from the depth of p. 330. 5 fathoms upon Andromache shoal, there is a 6-fathoms patch, north-east from which the depth is 7 fathoms for $3\frac{1}{2}$ miles.

Erase last two lines.

SEYCHELLES ISLANDS.—Bird island is quite flat, of an p. 331. irregular oval form, is about 8 feet above high water, and is composed of dead coral overlaid with sand. Thick scrub borders the beach all round except at the north point, where there is a broad sandy spit about 160 yards long. The eastern and southern sides of the island are fringed by coral for about 2 cables from the shore, which dries at low-water springs. Shoal water extends $1\frac{1}{4}$ miles to the north-west; in other directions for about half a mile. In the centre of Bird island there is a conspicuous clump of trees 58 feet high, and also a few cocoa-nut palms; close to the beach at the middle of the west side of the island there is a conspicuous tree 54 feet in height, near which there are a few fishermen's huts.

Anchorage can be obtained off the west shore of Bird island, from which an extensive bank of sand and weed extends for 4 miles. The place should be approached with the tree near the beach in line with the central clump bearing E. by N., and anchorage taken at one to $1\frac{1}{4}$ miles off the shore, in from $4\frac{1}{2}$ to 6 fathoms.

See chart, No. 721 and plan of Bird island, No. 724.

At 3 miles to the southward of Bird island there is a coral patch of 5 fathoms, and in the same direction at the distance of 4 miles, two other patches, upon which are depths of 8 and 9 fathoms respectively.

DENNIS ISLAND, the north-eastern of the Seychelles group, is situated on the edge of the bank, 28 miles E. by S. $\frac{1}{4}$ S. from Bird island. It is about three-quarters of a mile north and south, and one-third of a mile across, narrowing at the south end. A coral reef, which dries in patches, projects about two cables from its south and east sides; and a shoal flat with coral heads extends from the island southward and westward 6 cables, and northward nearly 2 miles. Dennis island is but a few feet above high water; it is flat, cultivated, covered with trees, and permanently inhabited. Landing can be effected according to the time of year, near the boat-houses either immediately west of the lighthouse, or just south of the west point.

The Lighthouse is in latitude $3^{\circ} 48' S.$, longitude $55^{\circ} 40' E.$ The light is reported to be obscured by trees on certain bearings between North and N.E. $\frac{1}{2}$ E.

Anchorage may be obtained in 7 fathoms, sand and coral, with the lighthouse bearing S.W. by W., distant 7 cables.

Shoals.—At 7 miles eastward of Dennis island there is a patch with 7 fathoms upon it; at 11 miles in the same direction, a depth of 9 fathoms.

p. 334.

MAHÉ.—PORT VICTORIA.—**Light.**—At line 1, for “47 feet” read “42 feet.”

Buoys and Beacons.—The following arrangement of buoys and beacons existed in October 1897 :—

- a. A buoy painted black at $13\frac{6}{10}$ cables N. 66° E. from the lighthouse, and N. 38° W. from the south-west point of St. Anne island.
- b. A buoy painted black at $3\frac{1}{2}$ cables N. 79° E. from the lighthouse.
- c. A bell buoy painted red and white, at $12\frac{7}{10}$ cables N. 55° E. from the lighthouse, and N. 42° W. from the south-west point of St. Anne island.
- d. A bell buoy painted red and white at $5\frac{1}{2}$ cables N. 58° E. from the lighthouse.
- e. A mooring buoy painted red at $6\frac{7}{10}$ cables N. 74° E. from the lighthouse.
- f. A mooring buoy painted red at 2 cables N. 36° E. from the lighthouse.

See plan of Dennis island, No. 724.

Beacons.—Inside the lighthouse, the edge of the reef on the south- p. 335.
east side of the harbour is marked by five masonry pillars with conical top ;
having an anchor with a ring built in at their base, for warping purposes.
The edge of the reef on the north-west side of the harbour is marked by
five similar beacons, painted red and white chequered.

The chains of the mooring buoys are rarely examined, and cannot be
depended upon. The buoys and beacons are not lighted as formerly when
a mail steamer is expected.

Inner harbour.—The depth on the shoal, situated N.E. $\frac{1}{2}$ E., p. 333.
 $1\frac{1}{4}$ cables from Victoria pier end, has been increased by blasting to
 $2\frac{1}{2}$ fathoms.

Tides.—It is high water full and change at port Victoria at 4h. 32m. ;
springs rise $3\frac{1}{2}$ to 5 feet, neaps rise 3 feet.

The height of the tide is affected by diurnal inequality, which is, however,
mainly confined to high water, the maximum difference observed between
two successive tides being $2\frac{1}{4}$ feet when the moon's declination was largest
in amount. The sequence of the two tides is from the higher high water
to the lower low water throughout the lunation.

Currents.—*Erase* footnote.

p. 337.

Rainfall.—The average rainfall is about 93 inches; in 1895 it
amounted to 101 inches.

Climate.—At last line, *for* "36 per 1,000" *read* "(in 1896),
33·6 per 1,000."

Supplies.—A contractor brings coal alongside, and also contracts for p. 338.
carriage of water, which can be obtained, of excellent quality, from a pipe
at the head of Hodoul jetty, and also at the landing place, two-thirds of
the way along Victoria pier.

Expunge footnote.

Shipping.—In 1896, the number of vessels that entered port Victoria p. 339.
(exclusive of 10 ships of war) was 62, whose total tonnage was 79,764 ;
of these 30, with an aggregate tonnage of 70,742, were mail steamers.

Exports in 1896 amounted in value to 1,569,912 rupees, which was
more than double that of the previous year, owing to the large vanilla
crop.

Imports in the same year amounted to 975,079 rupees.

Custom house.—*Expunge* paragraph relating to dogs.

See plan of Port Victoria, No. 722.

p. 340. **Hospital.**—The charge for first class patients is six shillings a day, for second class, three shillings.

Population.—The estimated population of the whole Seychelles group in 1896 was 16,560.

Telegraph.—Port Victoria is in telegraphic communication with Mauritius and Zanzibar by direct submarine cable.

Silhouette.—The inhabitants, about 300 in number, are chiefly employed in the manufacture of cocoanut oil.

p. 341. **Madge rocks.**—At line 29, *for* "N.N.E. $\frac{1}{4}$ E." *read* "N. by E. $\frac{3}{4}$ E."

Trompeuse rocks are situated S. 51° W. $2\frac{1}{4}$ miles from the South Cousin, and N. 70° E., 3 miles from Madge rock.

p. 342. **Praslin island.**—The reef on the south-west side of this island extends seaward nearly 2 miles from the bight of the bay. A small rock showing 3 feet above high water lies $1\frac{1}{4}$ cables N.E. $\frac{3}{4}$ E. from Miller's point. The population number 1,150.

Curieuse island about 2 miles in length, with a mean breadth of a mile is 551 feet in height, a ridge of hills extending along the island from east to west. The south-west side of the island is foul, depths under 4 fathoms extending about a quarter of a mile. No lepers from Mauritius are sent here, only those from the Seychelles islands.

A shoal of $3\frac{1}{2}$ fathoms lies south-eastward of Curieuse, from which the south point of the island bears W. by S. $\frac{1}{2}$ S., and the east point, N.N.E.; it is distant 6 cables from each point.

At last line, *for* "Butt islands" *read* "Bat island."

p. 343. **Anchorage** in Curieuse bay may be taken in 9 or 10 fathoms with the east and south points of Curieuse island in line N.E. $\frac{1}{4}$ E., and the north point of Praslin bearing N.W. $\frac{3}{4}$ W.

Aride island, 443 feet in height, is about a mile in length east and west. **Booby island** is a small barren rock 92 feet high.

Cousins islands.—A sunken patch of rocks lies $1\frac{1}{4}$ miles N.W. $\frac{1}{2}$ W. from the North Cousin.

Whale rocks, consisting of two separate heads, lie $1\frac{1}{2}$ miles west from Miller's point (Praslin), and nearly $2\frac{1}{4}$ miles from the North Cousin.

La Digue island is triangular in form and 1,071 feet in height. A reef extends about 4 cables from the whole of the west side, the rest of the island appears free from reef. Population 800.

See chart, No. 1072, and plan of Curieuse bay, No. 723.

Les Roches Canales (The Wash) is a dangerous rocky cluster lying midway between Praslin and La Digue. It is about 4 cables in extent, and somewhat circular in form; the southern rock dries 4 feet at springs. The south end of Félicité island open of the north point of La Digue clears these rocks to the northward.

Ave Maria is 57 feet high; it is distant $1\frac{1}{2}$ miles E. by N. $\frac{1}{4}$ N. p. 344. from the east point of Praslin.

Félicité island is $1\frac{1}{2}$ miles long, 747 feet high, with a passage between it and La Digue of $1\frac{6}{10}$ miles.

Mary Anne Island is 425 feet in height.

The Sisters are two narrow islands, each nearly a mile long and separated by a deep channel a quarter of a mile wide, which lie about 5 miles eastward of Praslin. The east Sister is 371 feet in height, the other 347 feet.

Mellow rock does not exist, and has been removed from the charts.

Frigate island.—At line 30, for “550 feet” read “400 feet,” and at line 32, for “Mauritius” read “Mahé.”

Noddy rock (not Noddi) is awash at high water and generally p. 345. breaks heavily.

L'Ilot (not Lelot) is 80 feet high.

Chimney rocks lying $5\frac{1}{2}$ miles S. by E. $\frac{3}{4}$ E. from the south point of La Digue, are 20 feet high, and have no off-lying dangers.

Recif island about half a mile in length, and 156 feet high, lies 10 miles W. $\frac{1}{2}$ N. from Frigate island. Submerged rocks extend south-west and south-east for nearly half a mile from the south point, but one rock shows above water 15 feet.

La Perle reef.—At lines 2 and 3, for “north-west-by-north and p. 346. south-east-by-south” read “north-north-west and south-south-east.”

COETIVY ISLAND.—Soundings.—The northern limit of p. 347. the bank of soundings on the west side of Coetivy within the 20-fathoms contour-line, extends $9\frac{1}{2}$ miles W.N.W. from the north end of the island; the southern limits lie W. by S. $\frac{1}{4}$ S. 10 miles, and S.W. $\frac{1}{2}$ W. 6 miles, from the south point. The general depths upon the bank are from 13 to 17 fathoms, but in the south-eastern portion of the above defined area, there is a space occupied by depths of 4 to 6 fathoms. The edge of the bank falls almost precipitously into very deep water. Vessels passing the island should keep at least 6 miles from the south end of the island, from which a reef projects upwards of 3 miles.

See chart, No. 1072, and plan of Coetivy island, No. 724.

- p. 348. **AMIRANTE ISLANDS.**—At line 11, *for* “The islands” *read* “Some of the smaller islands”; and at line 26, *for* “low, no one” *read* “generally low, only four.”
- p. 349. **Eagle island.**—At last line, *for* “15 miles” *read* “9 miles.”
- p. 353. **Etoile cay.**—At line 31, *for* “51 feet” *read* “15 feet.”
- Boudeuse cay.**—At line 37, *for* “6 to 10 fathoms” *read* “4½ to 10 fathoms.”
- p. 351. **ISLE DESROCHES** in 1894 was almost entirely overgrown with casuarina trees, and the centre clump was extremely difficult to make out as a leading mark for the N.W. channel. The settlement may be used as a mark instead. The principal produce is maize; there are plenty of fish, some partridges, but very little water.
- p. 357. **ALPHONSE ISLAND** in lat. 7° 1' S., long. 52° 45' E., stands near the centre of a coral reef 2 or 3 miles in extent, at the north end of a group of sand and coral banks 12 miles long, and 5 miles in width, from which it is separated by a very deep channel. The island is covered with cocoanut trees, amongst which is a group of casuarina.
- p. 359. **Umzinto bank*** in lat. 9° 39½' S., long. 51° 18' E. and lying 20 miles S.E. by E. ¼ E. from Cerf island, is circular in shape and about 5 miles in diameter; it is composed of coral, the least depth known being 11 fathoms, with no soundings at 100 fathoms close to.
- p. 351. **FARQUHAR ISLANDS.**—The inhabitants numbered only 22, in August 1892. Turtle hill, north island, upon which a flagstaff stands, is 64 feet high. The coral reef west of the entrance has extended to the north-eastward about 2 cables. Wild guinea fowl, introduced in 1880, were very numerous in 1894 upon all the islands. Goelette island is covered with scrub, and has two cocoa-nut trees, which may be recognised 5 or 6 miles off.
- p. 362. **COSMOLEDO GROUP.**—**Menai island** has a flagstaff at its south end, where there is a fishing station. Rain water, which is fit for drinking purposes, is collected by a corrugated roof, and stored here in iron and zinc tanks. There are also means for distilling water. From June to December there are only two men on the whole group who are generally at Menai, but occasionally visit the other islands. They attend to the tanks, and keep charge of the property.

Anchorage may be had during the south-east monsoon off the north-west part of Menai, at one cable from the reef. In the north-west

* Steam-vessel *Umzinto*, April 1896.
See chart, No. 721, also plans on Nos. 724 and 718.

monsoon the only anchorage is at the entrance of the south-east passage. There is no other anchorage at the Cosmoledo group.

Observation islet.—At lines 1 and 27, for “Observatory islet” p. 363. read “Observation islet.”

North islands.—At line 7, for “10 feet” read “15 feet.”

Goelette island.—At line 8, for “is very low” read “is 10 feet high.”

Wizard island.—There is a fishing station near the north-east point. Water collected by a corrugated iron roof is stored here in tanks and barrels.

ASTOVE ISLAND is an atoll in about lat. $10^{\circ} 6' S.$, long. $47^{\circ} 45' E.$, 2 miles long and $1\frac{1}{4}$ miles across which is situated 22 miles S. by E. from the Cosmoledo group. The entrance to the lagoon in which there is a depth of 3 or 4 feet, is at the south-west end, over a bar which dries at low water. There are sandhills about 45 feet above the sea on the eastern part of the atoll, and near the beach on the west side a single cocoanut palm; another single palm stands at the south-eastern corner of the lagoon. There is brackish water in a well near the western tree, but none fit for drinking. Turtle are very numerous and fish plentiful.

Anchorage during the south-east monsoon is westward of the single palm, and should be with a kedge sent to the shore reef; in the north-west monsoon an anchor may be dropped close to the reef on the lee side.

ALDABRA.—West island.—There is a settlement at the west point of West island near a flagstaff, from which the Union Jack is shown when a vessel appears in sight. Cocoanut and cedar trees grow on this island where there is now (1895) some cultivation of maize, pumpkins, water-melons, &c. Water is collected from the corrugated iron roofs of the dwellings here, and kept in tanks; it is also stored in covered coral basins. Turtle and hawksbill turtle are numerous; fish and oysters are plentiful; there are also a few goats here.

From June to December only two men remain on the islands, who attend to the water supply, and hoist the flag as required.

At line 16, for “between” read “between.”

South island.—There is a water-hole at the south-eastern part of this island which is said never to run dry.

Middle island.—At line 36, *erase* “which may be seen at a distance of 25 miles.”

Cocoanut island has (1895) about 100 cocoanut trees growing upon it.

See plans on No. 718.

West channel is between the third and fourth small islet southward from West island.

p. 368. **Tides.**—At line 24, *for* “range about 3 feet” *read* “rise about 5 feet.”

Produce.—At lines 34 and 35, *for* “still survives but in very diminished numbers” *read* “still survive (1892) in large numbers.”

Wood and Water.—Water is collected in tanks and casks at West island, and also in covered basins formed in the coral; the collection and care of which is superintended all through the year.

p. 369. **ASSUMPTION ISLAND.**—At the north end of the bay on the west side of Assumption there are a couple of cocoanut trees, and a cluster of four trees at the south end. No drinkable water has been discovered, but doubtless brackish water exists somewhere, as there are (1895) about 300 or 400 goats on the island.

CHAGOS ARCHIPELAGO.—At line 26, *for* “Solomon islands” *read* “Salomon islands.”

p. 370. **Speakers bank.**—At last line, *for* “Perus Banhos” *read* “Peros Banhos.”

p. 372. **Benares shoal.**—At line 12, *for* “half a mile long” *read* “1½ miles long.”

South-east reef.—At line 25, *after* “Coin du Mire” *read* “westward of the latter, the submerged reef has but 3 fathoms upon it.”

p. 376. **Danger island.**—At line 12, *for* “south-west” *read* “south-east.”

p. 380. **DIEGO GARCIA.—Population and Laws.**—There is no resident police officer, and the manager of the establishments officiates as justice of the peace. The place is supposed to be visited by a magistrate from Mauritius once a year, to which island all important cases are sent for trial. The total population in June 1896 amounted to about 500. The establishment at Minni Minni has been done away with.

p. 381. **Approach.**—In making this place the tops of the dense masses of trees show up well, and can be seen from a considerable distance.

East island.—The flagstaff formerly here has been removed, and no huts remain upon it.

Middle island.—There were no dwellings on this island in 1896.

p. 382. **West island.**—There is no flagstaff here, but the cluster of palms at the south-west point of the island is conspicuous.

See plan of Assumption, No. 718; also of Diego Garcia, No. 920.

Landmarks.—Barton point is low, covered with scrub, and has a cluster of short palms a little distance inside the point. Eclipse point is thickly covered with palms to the water's edge, and can be easily made out. Marianne point is conspicuous with its white beach, houses, and dark trees; and makes a good mark to steer in upon. There is no pier here (1896).

Shoals.—A coral shoal about a cable in extent with a least depth of p. 383. 4 fathoms on it, is situated with the conspicuous clump (93 feet high) at point Marianne bearing S.W. $\frac{3}{8}$ W., distant $13\frac{1}{2}$ cables; and Minni Minni high tree E. by S. $\frac{7}{8}$ S. At 4 cables W. by N. $\frac{1}{2}$ N. from this shoal there is a patch of 3 fathoms.

Buoys.—These have been removed, except a red buoy, on the north- p. 384. west side of a cluster of rocks, W. by S. $1\frac{2}{10}$ miles from Minni Minni; and a buoy off East point.

Lights.—There are none exhibited or in contemplation. p. 385.

Supplies.—No supplies are procurable. p. 388.

Coal.—The coaling station has been completely given up, no coal being kept in store.

CHAPTER VII.

PRINCE EDWARD ISLAND.—Position.—At line 21, p. 390. for “lat. 49° 49' 30" S.” read “lat. 46° 49' 30" S.”; and at line 22, for “S. 54° E. (true)” read “S. 35° E. (true).”

CROZET ISLANDS.—Hog island.—At line 6, for “anchored p. 394. 12 fathoms” read “anchored in 12 fathoms.” The s.s. *Thermopylae* passed along the east shore of Hog island on 23 November 1895, when the hut appeared intact; no signs of human life were seen, but the beach and slopes were covered with sea-elephants, seals, and penguins.

Possession island.—The *Thermopylae* also steamed close along the p. 397. eastern shore of this island and noticed no indications of human life, but the grassy slopes were covered with seals, &c., and penguins. Apparently the huts had been undisturbed.

KERGUELEN ISLAND.—General remarks.—At line 20, p. 399. for “49° 56' S.” read “50° 0' S.”

Landfall.—At line 21, for “lat. 48° 47' S.” read “lat. 48° 27' S.” p. 403.

See chart, No. 803.

p. 403. **Icebergs.**—An iceberg 5 miles in length was observed in lat. $47^{\circ} 0' S.$ or 50 miles northward of Kerguelen, in January 1897.

Christmas harbour.—The French flag was hoisted here by the French war vessel *Eure* in January 1893.

At last line, for "south-east" read "north-west."

p. 407. **Table mount.**—At line 10, for "1,350 feet" read "1,215 feet."

p. 408. **Cumberland bay.**—At line 2, for "40 fathoms deep" read "21 fathoms deep."

Loom bay.—At line 33, for "Teal" read "Seal."

p. 409. **Glass rocks** are a chain of black islets, that from their colour stand out clearly, and may be seen from a good distance, even in misty weather.

Rhodes bay.—The entrance to this bay is quite safe and clear of weed.

p. 410. **Bird rock.**—The *Eure* obtained the depths of 11, 17, and 19 fathoms at about $1\frac{1}{4}$ miles east from this rock.

Mary harbour is, in gales, subject to severe williwaws, which descend from the surrounding heights with great fury, first from one direction, then from another. Vessels are very liable to drag, as the holding ground being soft mud, is not good. The *Eure* dragged with three anchors down and six times as much cable as depth of water, using steam as well. Only a part of the harbour can be used for anchorage, the bottom of the bay being choked by deposit from the numerous cascades. The best anchorage is in the centre, in about 6 or 7 fathoms; farther in, the depth decreases rapidly to $2\frac{1}{2}$ fathoms. There is kelp right across the entrance, but by passing through where it is least thick, and keeping nearer the north point, nothing less than $7\frac{3}{4}$ fathoms was found.

p. 412. **Francis island** is well defined, clear of the land, and is easily recognised by its inclined slopes and three superposed terraces.

Middle harbour.—The anchorage in 6 or 7 fathoms is at the mouth of this harbour, as a ridge of rocks stretches across the channel, at half a mile within the entrance points.

p. 413. **Henry island.**—At line 19, for "western" read "eastern."

p. 415. **HILLSBOROUGH BAY.**—Fairway rock is a small black islet, only a few feet high, and apparently free from danger on its east side; it always breaks. Schultz rock uncovers at half tide, and probably never

covers entirely, as it always breaks, and is surrounded by ke'p, which extends to it from cape Wachenhusen. Cape Ahlefeld is the extremity of a peninsula, formed by two high conical mountains, terminating in a chain of small black islets almost awash. Off cape Wachenhusen is an island 50 to 60 feet high, covered with verdure.

At line 24, for "160 feet high" read "460 feet high."

Gazelle basin.—The *Eure* found perfect protection and comparatively fine and sunny weather in this anchorage during a stay of eight days. It seems to be the breeding place of sea birds. There are also many ducks, teal, and rabbits. The latter have overrun the place, and left but little of the Kerguelen cabbage.

Supplies.—A depôt for the use of shipwrecked seamen has been established here. The depôt is situated in the south-eastern part of Jachmann peninsula, Hillsborough bay, near the south-western shore of the eastern lake, and about half a mile northward of the coast, opposite Gazelle basin. It is in a cave at the foot of the west cliff of a rocky chasm, running north and south, and its position is indicated by a stone cairn, 11½ feet in height, and about 14 feet broad at the base, erected on the summit of the west cliff of the chasm.

This cairn, visible from Gazelle basin, is painted black, and shows clearly against the grey rocks which form the background.

The entrance to the cave has been closed by large stones, and on the cliff a few yards above it is the inscription :—

Vivres et Vêtements, Eure, Janvier 1893.

Approximate position, lat. 49° 16' 45" S., long. 69° 40' 30" E.

This depôt contains :—

2,204 lbs. of preserved beef in boxes of 9 lbs.

1,102 lbs. of biscuits.

20 swan-skin shirts.

20 pairs of woollen drawers.

20 woollen blankets.

4 packets of matches.

The boxes of preserved beef are stowed in a pile, coated with coal tar. The biscuits are in 4 iron-hooped barrels, thickly covered with coal tar. The clothes are in two similar barrels. The matches are in a box, similar to the beef boxes, painted with minium (red lead) and with a label of the contents on it.

In the event of the cairn being destroyed, the following directions should be followed to find the depôt. Land on the north side of the inlet opposite Gazelle basin, in a small creek, sheltered by a rocky point, where

See plan of Gazelle basin, No. 800.

boats may go alongside under any circumstances of wind or tide. Proceed directly inland about half a mile as far as the shore of the lake, then turn to the westward and follow the lake to its western end, where the chasm in which the depôt is situated will be seen on the left hand.

A flagstaff is also erected at the head of the bay near the channel leading to Fine-weather harbour, and an official report of the taking possession buried near it.

Fine-weather harbour.—The commander of the *Eure* reports that this is not a good anchorage. North and north-west winds raise a sea sufficient to be dangerous for boats. Rocks awash were also observed in certain places.

Directions.—The commander of the *Eure* recommends passing one mile eastward of Fairway rock and Schultz reef when entering Foundry branch.

Kirk harbour.—This harbour, entered by mistake for Foundry branch by the *Eure*, was found to be full of kelp; the ship obtained soundings of $4\frac{1}{2}$ fathoms, and $2\frac{1}{2}$ fathoms under the stern when turning to come out. It is therefore useless as an anchorage.

p. 417. **Accessible bay.**—Kent island, off the entrance to Accessible bay, is 80 feet in height, outer Kent island, 50 feet. The highest of the Rocks of Despair is 50 feet above high water level.

At line 21, for "320 feet high" read "220 feet high."

ROYAL SOUND.—At line 31, for "6 miles" read " $8\frac{1}{2}$ miles."

p. 418. **Wyville Thomson peninsula.**—At line 10 and elsewhere, for "Thompson" read "Thomson."

p. 419. **Supply bay.**—At lines 5 and 6, for "is along the north coast of Wyville Thomson peninsula southward of Long island, thence," read "is southward of Long island and between it and Wyville Thomson peninsula; thence."

Cape Challenger.—At last line, for "peak named" read "peak, 2,720 feet high, named."

p. 420. **Volage bay.**—At line 24, for "Observation bay" read "Observatory bay."

p. 421. **Table bay.**—The *Volage* touched the ground off Table bay, about one mile west of the outer island off the east side of the entrance to that bay. From the position where she grounded cape Bourbon was said to bear N.W. by W., and the island between Table and Iceberg bays,

See chart, No. 2398, and plans, Nos. 800 and 799.

N.N.E. $\frac{1}{4}$ E. These bearings do not agree with the chart in this locality; but the coast in the vicinity is so little known, that it is uncertain whether cape Bourbon is in error, or whether the islands in the deep bay west of Mount Ross are wrongly shown. Approximate position, lat. $49^{\circ} 37' S.$, long. $69^{\circ} 18\frac{1}{2}' E.$ See lines 18 to 21.

BENODET AND SOLITARY ISLANDS AND SALAMANCA ROCKS.—Further information has been received from Mr. Greenstreet, commanding the steamer *Rimutaka* that, on 13th December 1893, when passing south of Kerguelen island, he sighted Mangan or Round island, which he estimated to be 300 feet high.

The Benodet (Tremarec) islands were observed to be South (true) of Round island, or in lat. $50^{\circ} 0' S.$, long. $68^{\circ} 55' E.$; or very nearly in the position assigned to them by Mr. Robson, commanding the *Talavera*, in 1891, who placed them in lat. $50^{\circ} 1' S.$, long., $68^{\circ} 49' E.$

In consequence of these reports Benodet islands are now placed on the Admiralty charts in lat. $50^{\circ} 0' S.$, long. $68^{\circ} 52' E.$

Mr. Greenstreet also sighted the Salamanca rocks, originally reported by Mr. Robson of the *Salamanca* in 1880, who placed them in lat. $50^{\circ} 0' S.$, long. $69^{\circ} 30' E.$, but Mr. Greenstreet places them in lat. $49^{\circ} 55\frac{1}{2}' S.$, long. $69^{\circ} 32' E.$

The probable position of these rocks is lat. $49^{\circ} 58' S.$, long. $69^{\circ} 31' E.$, and they are now so shown on the Admiralty charts.

Solitary island was also stated by the commander of the *Talavera* to be 10 miles south of its charted position in 1891, or in lat. $50^{\circ} 0' S.$, long. $68^{\circ} 35' E.$, which has been accepted for the Admiralty charts.

McDonald islands.—At line 22, for "westward" read "north- p. 422.
west"; and at line 30, for "630" read "620."

Shag islets.—At line 25, for "north-eastward" read "eastward." p. 423.

ST. PAUL ISLAND.—The French war vessel, *La Bour-* p. 425.
donnais, hoisted the French flag in October 1892. The island was again visited in January 1893, by the French despatch transport *L'Eure*, when a depôt of provisions for shipwrecked seamen was established.

The depôt is in a hut of rough stones with a thatched roof, situated on the northern side of the crater, near the jetty, and about 50 yards from the flagstaff:—

Approximate position, lat. $38^{\circ} 42' 45'' S.$, long. $77^{\circ} 34' 40'' E.$

p. 426.

This depôt contains:—

1,323 lbs. of preserved beef in boxes of 9 lbs.

1,102 lbs. of biscuits.

10 woollen shirts.

10 blankets.

One soldered metal box containing 4 packets of matches.

See chart, No. 749a, and plan of St. Paul island, No. 1921.

The provisions and clothes are in 13 iron-hooped barrels, coated with tar and sand, and placed under a tarpaulin. On the door of the hut is the inscription, *France, Vivres et Vêtements pour naufragés, Eure, Janvier 1893*; and a similar inscription is on a board within the hut.

The commander of the *Eure* reports that the fishermen who frequent the island consider that the bar is formed by a solid bridge, and that the rocks seen are boulders and *débris* washed up during gales, which eventually find their way down into the crater. The crater offers very little protection in gales, even to small craft, on account of the heavy williwaws. The French schooner *Décidée* parted all her lashings with which she was secured inside the north point of entrance, and foundered on the west shore. The *Angèle Elisa* narrowly escaped a similar fate. The volcanic springs were in full activity. The cliffs at the entrance to the crater are crumbling and washing away. The stone marking the transit of Venus spot has disappeared. Captain Mouchez' observation spot, also, is now swept by the sea.

p. 427.

Tides at the bar often run 2 to 3 knots.

AMSTERDAM ISLAND, the northernmost island, on which the French flag was hoisted by the war vessel *La Bourdonnais* in 1892, was visited by the *Eure* in January 1893, and a dépôt for shipwrecked seamen established.

p. 430.

The dépôt is in a large cavern in the side of a hill, about W. by S. $\frac{1}{2}$ S., 800 yards from Hosken point, the north-east extreme of the island; and bears W. $\frac{1}{2}$ N., distant about 600 yards from the first flagstaff southward of that point.

At the entrance to the cavern is a board, fixed to two upright tarred posts, with the inscription, *France, Vivres, Vêtements pour naufragés, Eure, Janvier 1893*, on it.

This dépôt contains :—

1,323 lbs. of preserved beef.

1,102 lbs. of biscuit.

10 woollen shirts.

10 pairs cotton drawers.

10 blankets.

One soldered, metal, red box, containing 4 packets of matches.

Approximate position, lat. $37^{\circ} 48' 50''$ S., long. $77^{\circ} 32' 30''$ E.

The landing place used by the *Eure* is about 400 yards southward of Hosken point, and under the flagstaff mentioned above.

Directions for finding the dépôt on Amsterdam :—Having landed, go to either of the flagstaffs, from whence a cross will be seen; from the cross follow the direction of its arms, leading past two ruins of rough

See chart No. 1945.

stones, and then directly to the cavern, the entrance to which faces seaward. In the cavern, besides the provisions and clothing, there are cots, a cooking pot, and dry wood, left by the fishermen who sometimes live there. Cabbage and celery will be found near, and fish and lobsters (crawfish) abound near the landing place.

There are reported to be cattle at the south-west part of the island, and a few rabbits.

Landing is effected with ease in fine weather alongside a rock ; as there is deep water close to, the sea does not break, but in rough weather it would be a matter of great difficulty. When the fishing establishment was in existence two iron davits were used in bad weather for hoisting the boat, which was, after being hoisted, conveyed on to the beach by a small tramway. The method of anchoring a boat and veering her stern into the shore is stated to be impracticable.

This landing is marked by a flagstaff placed about 100 yards inshore.

RÉUNION.—Port des Galets.—The depth of 27 feet at the entrance of the outer port, exists only in the central third of the passage ; in which part large vessels when entering or leaving must be rigorously kept, to avoid injury from any boulders or stones that may be on either side of the deep part of the channel. The right-angled turn into the inner basin is a difficult operation in such a limited area. The general depth both in the outer port and in the basin is 25 feet, but it is reported (1895) that some shoal spots in the harbour have not yet been removed. Vessels ascend greatly alongside the quays when the rollers outside are heavy. The entrance is reported to have shoaled, and dredging operations are still in progress.

Shipping, Imports and Exports.—See page 55. p. 444.

PORT VICTORIA.—Buoys.—See page 60. p. 446.

Beacon island.—At lines 31 and 32, for “ 1½ miles east-south-east ” read “ three-quarters of a mile south-east.” p. 447.

Cerf island.—At line 15, for “ 347 ” read “ 270 ” ; and at line 16, for “ 270 ” read “ 347.” p. 448.

Anonime island.—At line 19, for “ Anonimo ” read “ Anonime.”

Harrison rocks.—At lines 32 and 33, for “ east-by-north from the northern ” read “ N. 85° E. from the southern.”

Morne Blanc.—At line 14, for “ 2,155 ” read “ 2,206.” p. 450.

See chart, No. 1497.

INDEX.

	Page		Page
Abbé bank - - -	55	Andriava Rangotro shoal - - -	22
Accessible bay - - -	70	Andromache shoal - - -	59
Agalega islands - - -	58	Androtra (nosi) - - -	39
Albatross rocks - - -	39	Andya-Ku point - - -	22
Aldabra islands - - -	65	Angontsi (Ngonci) road - - -	15
Alphonse island - - -	64	Anjombavola (nosi) - - -	21
Amarella sand - - -	39	Ankarami mountain - - -	24
Ambalahoko village - - -	41	Ankaramisampana (Dover castle) -	11
Ambararata bay - - -	22	Ankeva village - - -	44
----- cliffs - - -	27	Ankitikona hill - - -	22
----- hill - - -	28	Anonime island - - -	78
Ambatoarara hill - - -	21	Anorontani, cape - - -	14
Ambatomifoko point - - -	27	Anosi point - - -	51
Ambatosarotra cliffs - - -	38	Anositrombi village - - -	20
Ambavatobi (Dalrymple) bay -	23	Antálaha point - - -	15
Ambenja village - - -	28	Antambo river - - -	25
Amber, cape, directions - - -	10	Antongil bay, Nosi Marosi - - -	15
----- island - - -	58	-----, Port Choiseul - - -	15
----- mount - - -	11	-----, Tanjona - - -	15
Amboaniho semaphore - - -	14	Antsahambingo rock - - -	31
Ambobibé village - - -	47, 50	Antsirana - - -	12
Ambohitsambo - - -	27	-----, lights - - -	13
Ambolibozo bluff - - -	25	Aride island - - -	62
Amirante islands - - -	64	Assumption island - - -	56
Ampahofaho point - - -	23	Astove island - - -	65
Ampajoni pass, buoyage - - -	29	-----, anchorage - - -	65
Ampasilava bay - - -	46	Ave Maria island - - -	63
-----, anchorage - - -	47		
Ampasimanoro village - - -	52		
Ampombilava reef, buoy - - -	23		
Amsterdam island, supplies -	72		
Anakao point - - -	53	Bali, or Boyanna bay - - -	35
Andavaloaka point - - -	49	Baramahamai river - - -	24
Andefitra point - - -	47	Barker bank - - -	34
Audiako point - - -	22	Barlow island - - -	45
Andovoranto, trade - - -	5	Barn hill (Talio Koaka) - - -	52
Andrahomanana mount - - -	21	Barren islands - - -	39
Andrakaka peninsula - - -	11	Bat island - - -	62
Andramaimbo (Windsor castle) -	10	Bawden shoal - - -	45
Andramona (nosi) - - -	48	Bayfield sand - - -	38
Andrano (nosi) - - -	40	Bé (nosi), reef - - -	48
Andranolava pass - - -	29	-----, trade - - -	5
Andranomena village - - -	28	Beacon island - - -	73
Andranomodi, cape - - -	11	Beaufort island - - -	39
Andranto - - -	24	Befotaka bay, shoal - - -	22
Andriana shoal - - -	30	----- point - - -	51
Andriangori (nosi) - - -	45	Bel-air lighthouse - - -	55
Andrianmitarika (nosi) - - -	46	Belo village - - -	44
-----, reef N.E. of - - -	46	-----, anchorage - - -	45
		-----, shoals off - - -	45

	Page		Page
Belo village, tides - - -	45	Curieuse island - - -	62
Bembatooka bay - - -	30	Cyclones - - -	7
Bemoka (nosi) - - -	49		
Benares shoal - - -	66		
Benodet islands - - -	71	Dalrymple bay - - -	23
Berangomaina hill - - -	24	_____ island - - -	40
Berofia, or Nosi Ovi - - -	24	Danger island - - -	66
Betsiboka river - - -	32	Dart shoal - - -	37
_____, tides - - -	33	Dauphin, Fort - - -	21
Bevato island - - -	47	_____, communication - - -	6
Beza (nosi) - - -	31	Demoké river - - -	41
Bird island - - -	59	Dennis island - - -	60
_____, anchorage - - -	59	_____, lighthouse - - -	60
_____ rock - - -	68	_____, shoals - - -	60
Black river bay - - -	57	Desroches - - -	64
Boina bay - - -	33	D'Estaing shoal - - -	42
Bombetoke (Bembatooka) bay - - -	30	Diamond bank - - -	26
_____, buoyage - - -	30, 31	Diego Garcia island - - -	66
_____, channels - - -	31	_____, buoyage - - -	67
_____, villages - - -	33	_____, coal - - -	67
Booby island - - -	62	_____ Suarez bay - - -	11
Bordeaux - - -	6	_____, Antsirana - - -	12
Bosi village, shoal near - - -	43	_____, approach - - -	11
Boteler hill - - -	35	_____, communication - - -	6
Boudeuse cay - - -	64	_____, Langor (nosi) - - -	11
Boursaint bank - - -	29, 39, 44, 46	_____, lights - - -	11, 12, 13
Boyanna (Bali) bay, anchorage - - -	36	_____, Nievre, port - - -	13
_____, directions - - -	35	_____, Oronjia pass - - -	12
_____, supplies - - -	36	_____, supplies - - -	12
		Digue (La) island - - -	62
		Discoloured water - - -	20, 21
Cape of Good Hope - - -	6	Dombala (nosi) - - -	18
Cargados Carajos - - -	59	Dondosi (nosi) - - -	40
Cavalier bank - - -	30	Dover castle hill - - -	11
Cerf island - - -	64, 73	Dundas island - - -	11
Chagos archipelago - - -	66		
Challenger, cape - - -	70	Eagle island - - -	64
Chesterfield island - - -	37	Ekiena village - - -	20
Chimney rocks - - -	63	Emile bank - - -	36
Choiseul, port - - -	15	_____ Héloise bank - - -	38
Choumare reef - - -	21	Erdwin bank - - -	23
Christmas harbour - - -	68	Etoile cay - - -	64
Cocoa-nut island - - -	65	Europa island - - -	54
Coffin island - - -	38	Euryalus bank - - -	29
Coin du Mire - - -	66		
Communication, Madagascar - - -	6	Faho (nosi) - - -	18
Comoro islands - - -	5	Fali (nosi) - - -	24
Cordeliere bank - - -	43	False Table hill - - -	26
Cosmoledo islands - - -	64	Fanemotra bay - - -	50
Courrier bay - - -	21	Fanihi (nosi) - - -	23
Cousins island - - -	62	Farafangana village - - -	20
Crab island - - -	46	_____, trade - - -	5
Crescent reef - - -	39		
Crozet islands - - -	67		
Cumberland bay - - -	68		

	Page		Page
Faraoni river - - -	20	Jibuti - - -	6
Farquhar islands - - -	64	Juan de Nova - - -	37
Fasi (nosi) - - -	49		
Félicité island - - -	63	Kakambana (Kakamba) bay -	23
Fénérive, tides - - -	16	Kalakajoro (Karakajoro) shoals -	24
Fernande shoal - - -	37	Kalomisampa islet - - -	22
Fiberenana river - - -	51	Kandrani hill - - -	30
Fine-weather harbour - - -	70	Kasenji river - - -	36
Flinders island - - -	39	Katsépé pass - - -	30
Flying Fish shoals - - -	37, 38	Kerguelen island - - -	67
Fonga (nosi) - - -	18	_____, Christmas harbour	68
Forfait bank - - -	29	_____, Francis island -	68
Foule point (Rafala), roadstead -	17	_____, Gazelle basin -	69
_____, tides -	17	_____, Glass rocks -	68
Francis island - - -	68	_____, Hillsborough bay	68
Frederick point - - -	11	_____, icebergs -	68
Frigate island - - -	63	_____, landfall -	67
		_____, Mary harbour -	68
Gabrielle shoal - - -	19	_____, Middle harbour -	68
Galets, Port des - - -	73	_____, Rhodes bay -	68
Galleon bay - - -	21	_____, supplies -	69
Gas buoys - - -	8	_____, Table bay -	70
Gazelle basin - - -	69	Kilibé point - - -	51
Glass rocks - - -	68	Kimbi, cape - - -	42
Glorioso islands - - -	21	Kirk harbour - - -	70
Goelette island - - -	65	Kivinja village - - -	41
Gouffres, cape - - -	14	Komani cliffs - - -	29
Graud pass, directions - - -	27	Komba (nosi) - - -	23
Green island - - -	13		
Grenouille shoal - - -	36		
		Lamboharana point - - -	50
Hao (nosi) - - -	49	Lampaolona river - - -	46
Hara (nosi), directions - - -	22	Lango (nosi) or Langa - - -	26
Harrison rocks - - -	73	Langor (nosi) - - -	11
Havre - - -	6	_____, light - - -	12
Hellville, buoy - - -	23	Larrée point, anchorage - - -	16
_____, communication - - -	6	Lava (nosi), or Heywood island -	40
_____, tides - - -	23	_____, rocks near - - -	25
_____, trade - - -	5	_____, tides - - -	26
Henry island - - -	68	L'Ilot island - - -	63
Hewett island - - -	40	Liverpool, Port - - -	21
Heywood island - - -	40	Loatrafasano (nosi) - - -	12
Hillsborough bay - - -	68	Lockwood reef - - -	40
Hindustan, west coast, to Mauritius	10	Lokobe mount - - -	22
Hog island - - -	67	Longo (nosi) - - -	11
Horsburgh island - - -	40	Loom bay - - -	68
		Lorenzo Marques - - -	6
Iavibola - - -	20	Louis, Port - - -	55
Icebergs - - -	9, 68	_____, cyclones - - -	55
Intermédiaire bank - - -	27	_____, weather - - -	56
Irognono - - -	22	Lovocampi village - - -	53
Ironono - - -	22	Loza peak - - -	26
Iteri, cape - - -	49	Lynx reef - - -	36
		Lyra bank - - -	25

	Page		Page
Macé shoal - - - - -	44	Maroansetra - - - - -	15
Madagascar, communication - - - - -	6	Maroantali (nosi) - - - - -	39
-----, currents on east coast - - - - -	9	Marolahi point - - - - -	26
-----, cyclones - - - - -	7	Maromoni point - - - - -	26
-----, history - - - - -	4	Marosi (nosi) - - - - -	15
-----, rain - - - - -	9	Marotaolana - - - - -	26
-----, trade - - - - -	4	Marseilles - - - - -	6
-----, weather - - - - -	8	Mary harbour - - - - -	68
-----, winds on east coast - - - - -	7	Mary Anne island - - - - -	63
Madge rocks - - - - -	62	Masianaka river - - - - -	20
Maévarano - - - - -	32	Masiaposa, or Table hill - - - - -	27
Mahajamba (Majamba) bay - - - - -	27	Masikoro, port, directions - - - - -	54
-----, anchorage - - - - -	28	Mathurin bay - - - - -	58
-----, banks off - - - - -	29	Mauritius, cyclones - - - - -	55
-----, directions - - - - -	28	-----, docks - - - - -	57
-----, supplies - - - - -	28	-----, Grand port, beacons - - - - -	57
-----, tides - - - - -	28	-----, buoys - - - - -	57
Mahambo, directions - - - - -	16	-----, observatory - - - - -	55
Mahanombi river - - - - -	50	-----, repairs - - - - -	57
Mahanoro, bank near - - - - -	19	-----, telegraph - - - - -	57
Mahatintzo point, buoy - - - - -	23	----- to Bombay - - - - -	10
Mahé island - - - - -	60	----- Zanzibar - - - - -	10
Mahela, shoal near - - - - -	19	-----, trade - - - - -	57
Mainia hill (Table mountain) - - - - -	51	-----, water - - - - -	57
Maintirano - - - - -	41	-----, weather - - - - -	56
-----, anchorage - - - - -	41	Mavoni (nosi) - - - - -	39
-----, dangerous bank - - - - -	38	Mayotta - - - - -	6
-----, North pass - - - - -	39	McDonald islands - - - - -	71
-----, South pass - - - - -	40	Mellow rock - - - - -	63
-----, tides - - - - -	41	Menai island - - - - -	64
-----, trade - - - - -	6	Miandroka river - - - - -	43
Makaubi island - - - - -	33	Middle harbour - - - - -	68
-----, tides - - - - -	33	Milanza bank - - - - -	37
----- pass - - - - -	30	Minow islands - - - - -	22
Mamirano bay - - - - -	50	Mojanga, anchorage - - - - -	32
Manakara point - - - - -	27	-----, telegraph - - - - -	32
Manambolo river - - - - -	42	-----, tides - - - - -	32
-----, trade - - - - -	6	-----, trade - - - - -	5
Manambondro - - - - -	20	Moramba bay - - - - -	27
Manana channel - - - - -	32	Morne Blanc - - - - -	73
Mananivo bay - - - - -	21	Morombé, cape - - - - -	48
Mananjara river - - - - -	19	Morondava river - - - - -	43
-----, trade - - - - -	5	-----, anchorage - - - - -	44
Manantina - - - - -	20	-----, tides - - - - -	44
Manghili (nosi) - - - - -	40	-----, trade - - - - -	5
Mangoaka - - - - -	28	Mozambique, communication - - - - -	6
Mangoka river - - - - -	47	Mpanjaka, bank - - - - -	39
-----, landmark - - - - -	47	-----, breakers - - - - -	38
Maninzari village - - - - -	9	-----, rock - - - - -	50
-----, anchorage - - - - -	19	-----, shoal - - - - -	37
-----, trade - - - - -	5		
Manombo river - - - - -	50		
-----, anchorage - - - - -	50		
Mari Eugénie shoal - - - - -	17	Nab reef - - - - -	35
Mariner bank - - - - -	29	Namakia passage - - - - -	29
Maroambitsi bay - - - - -	35	Narcissus bank - - - - -	30

	Page		Page
Narendri bay - - -	37	Ranambo reef - - -	20
Nazareth bank - - -	58	Ranobé, Port - - -	50
Ngonci (Ngontci) road - - -	15	———, anchorage - - -	51
Nievre, port - - -	13	———, tides - - -	51
———, anchorage - - -	13	Ranopasé village - - -	47
———, lights - - -	13	Ratafani (nosi) - - -	48
———, shoal - - -	12	Raynaud (mount) - - -	11
———, storm signals - - -	13	Recif island - - -	63
———, tides - - -	12	Réunion, Bel-air lighthouse - - -	55
Noddy rock - - -	63	———, Pic Cimandef - - -	55
North islands (Cosmeledo) - - -	65	———, Port des Galets - - -	73
——— pass (Mahajamba) - - -	27	———, shipping - - -	55
——— (Maintirano) - - -	39	———, St. Paul bay, light - - -	55
——— sand - - -	38	———, trade - - -	55
North-east rock - - -	23	Rhodes bay - - -	68
Nosindolo islets - - -	48	Roches Canales (Les) - - -	63
		Rodriquez island - - -	58
		———, tides - - -	58
		———, trade - - -	58
Observation island - - -	65	Romanche bank - - -	29
Onilahé river - - -	52	Rontonina reef - - -	39
Oronjia pass (Diego Suarez bay)		Round island - - -	71
directions - - -	12	Royal sound - - -	70
———, point - - -	11	Ruby bank - - -	43
Osprey shoal - - -	45		
Pahanesi (nosi) - - -	21	Sada point - - -	35
Pahanji (nosi) - - -	21	Sahinana (Sahiguana) river - - -	22
Panantsova - - -	26	Saint Andrew, cape - - -	37
Parsons reef - - -	49	——— Augustine bay, tides - - -	53
Passages, Mauritius to Bombay - - -	10	———, winds - - -	53
——— Zanzibar - - -	10	——— Mary, port - - -	16
———, W. C. Hindustan to		———, communication - - -	6
Mauritius - - -	10	——— Paul bay, light - - -	55
———, Zanzibar to Seychelles - - -	10	——— island - - -	71
Perle (La) reef - - -	68	———, supplies - - -	71
Pic Cimandef - - -	55	Salamanca rocks - - -	71
Pointu rock - - -	21	Sambava, Vohimao to - - -	14
Porpoise reef - - -	37	Sambirano peak and point - - -	15
Port Said - - -	6	Sand island reef - - -	45
Port Victoria (Mahé) - - -	60	Sandy knoll - - -	45
Possession island - - -	67	Saolara village and anchorage - - -	53
Poydenot island - - -	58	———, reef - - -	53
Praslin island - - -	62	Sarodrano hill - - -	29
Prince Edward island - - -	67	——— village - - -	41
Purdy sand - - -	40	Sarondrano pass - - -	52
		Saya de Malha bank - - -	58
		Sepulchre island - - -	12
Radama, Port - - -	24	Seychelles bank - - -	59
———, anchorage - - -	25	——— islands - - -	59
———, directions - - -	24	Shaba (nosi) - - -	25
———, Verte island - - -	24	Shag islets - - -	71
Rafala (Foule point) - - -	17	Silhouette islands - - -	62
Rafaralahi bay - - -	24	Simpson sand - - -	40
Raminitok bay - - -	25	Sisters (The) - - -	63

	Page		Page
Sizibongi river - - -	42	Umsinto bank - - -	64
Smyth's island (Nosi Mavoni) -	39		
Soalala village - - -	35		
Soi (nosi) - - -	25	Valavo (nosi) shoal - - -	38
Solitary island - - -	71	Valiha (nosi) shoal - - -	22
South bank - - -	40	_____ outer shoals - - -	24
_____, anchorage - - -	40	Vangaindrano, trade - - -	5
_____ pass (Maintirano) - - -	40	Vao (nosi), dangers near - - -	38
South-east reef - - -	66	Vatomandefoka reef - - -	50
Square mountain - - -	11	Vatomandri - - -	18
Subervieville - - -	33	_____, anchorage - - -	19
Suez - - -	6	_____, saddle - - -	18
Supply bay - - -	70	_____, shoal - - -	18
		_____, trade - - -	5
		Vatu Ranu rock - - -	23
Table bay (Kerguelen) - - -	70	Vaudreuil bank - - -	24, 29, 38
_____ hill - - -	27	_____, rock - - -	19
_____ mount - - -	68	Vauru (nosi) - - -	23
Tafudru point - - -	23	Vei (nosi), anchorage - - -	54
Talio Koaka (Barn hill) - - -	52	_____, tides - - -	54
Tamatave, anchorage - - -	17	_____, trade - - -	5
_____, buoys - - -	17	Verte island - - -	13
_____, communication - - -	6	_____ islet - - -	24
_____, directions - - -	18	Vestal reef - - -	23
_____, Tanio beacon - - -	17	_____ shoal - - -	37
_____, tides - - -	18	Victoria, Port (Mahé) - - -	60
_____, trade - - -	4	_____, beacons - - -	61
Tani Keli light - - -	23	_____, buoys - - -	60
Tanjona, cape - - -	34	_____, supplies - - -	61
_____ pass - - -	34	_____, telegraph - - -	62
_____ town - - -	15	_____, tides - - -	61
_____, anchorage - - -	16	_____, trade - - -	61
Telegraph, submarine - - -	4, 32, 57, 62	Vigilant bank - - -	29, 35
Tent rock - - -	53	Vohimao bay - - -	13
Thetis bank - - -	27, 34	_____, anchorage - - -	14
Timpoi (nosi) - - -	48	_____, beacon - - -	13
Toni hill - - -	51	_____, buoys - - -	13
Trade, Madagascar - - -	4	_____, directions - - -	14
Tremarec islands - - -	71	_____, trade - - -	4
Trompeuse rocks - - -	62	_____ to Sambava - - -	14
Trozona (nosi) - - -	48	Volage bay - - -	70
Tsiananga point - - -	15	Volana (nosi) - - -	11
Tsijobonina river - - -	42	Vori (nosi) - - -	22
Tsimanandrafozana, beacon - - -	42		
_____ river - - -	42		
_____, trade - - -	6		
Tsimanencakoho passage - - -	29	Wash (The) - - -	63
Tsingilofilo bay - - -	47	Whale rocks - - -	62
_____, anchorage - - -	48	Windsor castle - - -	21
_____, directions - - -	48	Wizard island - - -	65
_____, tides - - -	49	Wyville Thomson peninsula - - -	70
Tsiomaro reef - - -	21		
Tulléar channel - - -	51		
_____, anchorage - - -	52		
_____, tides - - -	52	Zanzibar - - -	5, 6
Turquoise bank - - -	30	_____ to Seychelles - - -	10



